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GARDENING

FOR BEGINNERS

A HANDBOOK TO THE GARDEN

BY

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PREFACE

ALTHOUGH books on gardening are now many in number, there has scarcely as yet been one quite suitable for beginners—that is, both fully illustrated, and so plain and easy that it does not either alarm or discourage the absolute novice. There are many now who wish to learn, and a simple book that will put them in the right way, and be truly a beginner's book, telling all about gardening in the simple language that all can understand, and describing garden methods and practice in detail, can hardly fail to be welcome and helpful.

For the best of all gardening is always the simplest. Sometimes, in a little wayside cottage strip, that is tended by labouring folk who love flowers, there may be seen some combination of one or two or of two or three kinds of plants that is of so high an order of beauty that one may look in vain for anything as good in many a large place where skilled labour is abundant and expense is not considered.

Those who are growing old among the flowers become more and more aware that all the best things that can be seen or enjoyed in the garden are the simplest things, done in the simplest ways. One may even venture to say that this admirable quality of simplicity is the beginning and end of all good things in gardening. For instance, a child might be taught, as a first lesson in planting, to make a little edging of white Pink or of Thrift or of London Pride, and would be rewarded by seeing the result of its work a year after in its full beauty of young strength of bloom. Thirty or forty years later, the same child, now grown to full years of experience, will look at such a little two-year-old border, and will see that it is always a thing perfectly good of its kind, and a living

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source of satisfaction and delight. But, meanwhile, by slow degrees, and by learning and watching little things, each perhaps of slight importance in itself, but with some bearing on other matters that will distinctly help to build up knowledge, the outlook will have grown wider, and the once beginner, now a master of his craft, has learnt both to know his plants with all their wants and ways, and how to fit them, by placing the right plant or group of plants in the right spot, to all the widely varied conditions and demands of many gardens.

It is easy to go wrong, especially at first, by trying to use too many things at a time. It is true that the good gardener has to learn the ways and needs of a great many plants; it is a part of his training to work through a widely varied collection, and to obtain an intimate knowledge of all, but it is only when he has gained a close acquaintance with individuals that he can then select and combine, and rightly use his knowledge for the direct service of each special purpose. And then, if he have the divine gift of a right perception, refined and strengthened by humble searching and unwearied labour, and by training his mind to the modest level of regarding himself always as a beginner, he will in the end acquire that ultimate power which will enable him to use all his material with an aim as true and an attainment as sure as the child with his simple edging of one well-known and well-loved little flowering plant.

GERTRUDE JEKYLL.

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GERMAN IRIS OR FLAG IN THE ROYAL GARDENS, KEW.

GARDENING FOR BEGINNERS

GROUPS OF GARDEN FLOWERS

As a table of the most precious garden flowers is given at the end of this work, it is needless to describe every plant of importance, and perennial or garden flowers are not of equal value. Special distinction has been therefore given to a few groups necessary to every garden, however small.

Antirrhinum (*Snapdragon*).—Well-chosen Snapdragons, or Rabbits' Mouths as the children call them, are good garden flowers, but the striped, speckled, or bizarre coloured kinds are not desirable. The Antirrhinum should be more planted in borders and beds; it may be regarded quite as a bedding plant—that is, when the colours are limited to those that are purely self, rich, and decided. In many places the Antirrhinum is treated as a biennial, and seed sown in spring under glass will germinate sufficiently quickly to produce flowering plants the same year. When they are used for bedding, special kinds must be selected, as reliance cannot be placed upon seedlings coming true to colour. It is a very simple matter to propagate the plants by cuttings, which, if taken from moderately ripened growths, and dibbled under a hand-light in summer, will soon root. It is advisable to keep the young plants in a cold frame during winter; they frequently die off wholesale from damp and frost when in the open. Select three forms—pure white, clear yellow, and deep crimson; the pure white is a charming flower, and is named White Swan, at least that is the most popular variety of this kind. The crimson Snapdragon is a richly attractive variety. Avoid the squat Tom Thumb group, pigmy plants in which all the natural grace of the Antirrhinum is lost. When the garden wall is old and crannied, Snapdragons are one of the things to sow in the chinks.

Aquilegia (*Columbine*). — A garden without its Columbines is bereft of a dainty and pretty flower. There are, of course, species, and by intermingling them the present race of spurred and other garden forms has been obtained. Aquilegias may, indeed, for the garden go into two groups—those with spurs and those without these appendages which impart to the flower characteristic beauty. To the short-spurred class belongs our native Columbine, with its blunt spurs arching over together towards the insertion of the stalk. From this wild plant (*A.*

vulgaris) come the older garden forms in varieties of purple, dull red, pink, and white colourings. Of these a rather more modern development is a very strong growing kind with white flowers, much larger than in the type. The more modern garden Columbines are nearly all long-spurred, and though the older varieties of *A. vulgaris* have an unending charm both of their own beauty and of association with the gardens of old times, yet some of the long-spurred kinds are undoubtedly more graceful plants. For dainty loveliness and grace of carriage no plant of this family can rival the long-spurred, pale yellow Californian *A. chrysantha*, looking its best and happily thriving in some cool, half-shaded portion of the garden. To this beautiful plant a host of garden hybrids owe their origin. Many of these are tinted or suffused with pale pink, probably due to the influence of *A. canadensis* and species of red and yellow colourings. The Rocky Mountain Columbine (*A. cærulea*) is a very long-spurred kind; with its blue and white flowers and shorter growth it suggests a like garden use to the large-flowered Siberian *A. glandulosa*, which has a short spur. But of garden Columbines one of the most important is the beautiful blue and white *A. Stuarti*, raised by Dr. Stuart of Chirnside, N.B. Columbines should be considered biennials; they are true perennials, but often die out during the second year. Seeds are easily raised. Sow them as soon as ripe in a box of light soil, and place in a cold frame. Sow very thinly, and when the seedlings are of fair size transplant them to the place they are to beautify, remembering that moderately warm soils are most helpful to their growth. The double Aquilegia is a monstrosity. It is the beautiful series of spurred forms that are most welcome in the garden, and are the most useful for cutting. Columbine flowers are excellent for table decoration. Aquilegias are useful for pots too.

Aster (*Michaelmas Daisies or Starworts*).—This is a delightful group of hardy plants for the beginner. They are hardy, free, and vigorous, making clouds of colour in September and October, even lingering into November, when the Christmas Aster (*A. grandiflorus*) is a bunch of purple bloom. For fully three months Asters brighten the garden. The plants are cheap, and strong tufts put in during April, or when new growth is just commencing, will flower the same year, while their use for decorations is great; graceful sprays put into vases are a pleasure to look at. We dislike to see the Starworts bunched up like a sheaf of corn. They are plants of exquisite grace, which must not be destroyed, and for this reason a pretty way to use them is as flowers for breaking up level masses of evergreen shrubs. When Asters are planted amongst such things as Rhododendrons, they throw their sprays of flowers over the shrubs when these are without bloom. When a walk runs through a little wood, or some grassy path cuts into an old orchard, a rich colour picture comes in autumn when Starworts are planted at the sides. But they want careful "staking," not to show the stakes or to leave holes. One must try to get a surface of bloom without a break, a succession of colours so placed that each one helps the other. It is quite easy to make a sad hash of an Aster border unless the colour association is carefully considered. Asters, although so vigorous and hardy, should be given some

PERENNIAL ASTERS (MICHAELMAS DAISIES OR STARWORTS).

sort of culture—a rich, well-prepared soil, and give water freely in dry weather. Asters get ragged and worn out unless divided once in about three years and replanted in freshly made-up ground. The beginner in gardening, who is really interested in the pastime, should raise some seedlings. It is delightful to watch seedling plants flower; and how pleasurable is it when some beautiful thing opens out, born into the world through your efforts. Of course there are more blanks than prizes; that is the same in all walks of life. Sow the seed in pots when it is ripe, which will be, of course, in the autumn. The seedlings will then be large enough to plant out in the spring and flower during the autumn. There is this advantage in raising seedling Asters, the plants soon flower. One has not time to get weary with waiting.

The list in the table (see end of book) has been prepared by Mr. Beckett, of Aldenham Park gardens, Elstree, who grows Asters well and has raised many beautiful varieties. It is a long list, but all are good; there is not a bad kind in it.

Auricula (*Primula Auricula*).—*Early History*—This is what is termed by fanciers the "Show" Auricula, or, more properly, the Exhibition Auricula, because it has been grown for many generations by a class of amateurs whose great delight was to exhibit these plants in competition on a certain date, which was fixed in the south of England about the 20th of April, and in the Midland Counties about the 27th of that month. They seldom fixed the date in May, although the Auricula in the north has sometimes been in its best form in that month; but there is an old saying that, "The Auricula in May has had its day."

In the years following the publication of John Gerard's "Herbal" in 1598, we cannot tell how the Auricula was cultivated, nor in what manner the improvement of this flower was carried out; evidently it was a slow process, the art of cross-fertilisation not being understood. We know but little of the garden Auricula as a finely developed flower by the art of the gardener until the beginning of the nineteenth century. The Lancashire weavers cultivated it as their favourite flower early in the century, and it is owing to the care bestowed upon it by these worthy old florists, and the rivalry excited by the annual competitions, that the Auricula has arrived at its present state of perfection. The inception of the work was theirs, yet it has been nobly carried out by the present day fanciers, two of whom are yet happily with us, the Rev. Francis D. Horner and Mr. Benjamin Simonite. The interest excited by an Auricula exhibition is great even at the present time, and the National Auricula Society annually holds an exhibition of all classes of Auriculas, under the auspices of the Royal Horticultural Society, every year about the end of April.

The history of the Auricula has frequently been written, but little is known, except that the original parent is the Primula Auricula, an Alpine species with leaves finely powdered with a white farina, and flowers of a primrose colour in trusses. The leaves of the cultivated varieties are sometimes without any powder, others are densely covered with it, the flowers being of the most variable character: and it is

probable that these numerous varieties have been developed by the intercrossing of some other species of Alpine Primula. The fact that the Auricula is an Alpine plant gives us a clue to the treatment likely to be successful in cultivating it. A close atmosphere is most injurious; whenever it is possible air should be admitted over and under the plants, night and day, summer and winter. The only exception to frames not being open night and day is excessive frost. The plants may be frozen quite hard and suffer no injury.

Classes of Auricula.—The Auricula for garden purposes is divided into four sections—viz. Green-edged, Grey-edged, White-edged, and Selfs. This may seem unimportant to the cultivator who does not look too closely into the composition of the flower. It is so difficult to obtain green-edged varieties that unless the fancier had a definite standard of excellence to work up to in this class, it might speedily be ignored altogether, and the green-edged section would drop altogether out of existence. This type of Auricula is always placed first in exhibition schedules and in trade catalogues; probably there is no other reason for this except custom. The "pip" or corolla should be circular, and the petals ought to be free from notches in the margin. Seven to nine pips form a handsome truss; the foot-stalks ought to be stout, and the main stem ought also to stand up erect without the support of a stick.

The corolla ought to have a margin of green; rich dark green forms a beautiful setting for the velvet black ground or "body" colour. This black ground encloses a white centre, and the eye ought to be a clear, rich yellow. The white centre is formed of a dense coating of farina; the eye ought to be round, and the "paste" also circular. The body colour is sometimes angular or irregular; this, of course, is a fault, and the more solid this ground colour is the better is the flower esteemed.

A grey-edged Auricula differs from the green-edged type in the outer margin being slightly dotted with farina. This makes it appear grey; in all other points the standard of excellence is the same as in the green-edge.

The white-edge differs from the grey in the coating of farina being so dense that the edge appears quite white; the farina is never so dense as in the centre of the corolla, but the green margin is covered so thickly that it appears white.

The selfs are altogether different from either of the above classes. There is the yellow or orange-coloured eye, and the centre of dense white paste, but the margin is merely a solid unshaded colour of dark maroon, violet, red, or yellow.

There has grown up within the last decade or so a section termed Fancies. Of course, when a batch of seedlings is raised by cross-fertilisation from any of the above classes there are varieties outside these classes that are in their way very pretty. These have been cultivated and admired, even more so by many persons of taste than the more formal edged types. The larger proportion of them are merely edged varieties. They have the margin of green, grey, or white, but no ground colour; they are very pretty in the garden, and those who

admire them can grow them with the others, as, of course, the cultural requirements are similar.

Cultural Notes.—The Auricula is propagated by seed to produce new varieties, and the named varieties are increased by offsets. These ought to be allowed to remain on the plants until roots are formed at their base; if the offsets are removed before this they take a long time to strike out roots, and sometimes refuse altogether. Some varieties increase rapidly from offsets, others very slowly indeed. The writer has known a stock plant grown on from year to year for six consecutive seasons, and never form even one offset. These unproductive varieties will form long necks in two seasons, and it is best to cut the top of the plant off; when this is done, offsets are sure to be produced, and the top, if planted in sandy soil in a small pot, will also in time form roots. These offsets require careful attention, and must be repotted as they require it. An offset will require about eighteen months to grow into a full-flowering plant; and most of the varieties produce the finest trusses of bloom on young plants. The fine grey-edged Auricula, George Lightbody, is a notable instance of this. And in the self class Horner's Heroine is another favourable example.

Propagation by Seed.—This is the only way to obtain new varieties, as Auriculas do not "sport" into distinct forms, as does the Carnation or Chrysanthemum. In order to obtain good and distinct varieties, it is necessary to resort to cross-fertilisation, and in this case the classes ought to be kept by themselves. Green-edged varieties should be crossed with each other. There are now four very good varieties in cultivation, viz., Abbé Liszt, Mrs. Henwood, Shirley Hibberd, and Rev. F. D. Horner. All these four may be used either as seed or pollen bearers. No Auricula in any class will pass muster with a fancier if it is "pin-eyed"—that is, the stigmatic part of the flower protruding from the mouth of the corolla, with the anthers lower than the stigma. This would be a fatal defect, and however perfect the flowers might be in other respects, this defect would consign it to the rubbish-heap. An Auricula perfect in all its parts has the stigma placed near the base of the tube, with the anthers in the mouth; and to be sure that cross-fertilisation is effected, the anthers must be removed before the pollen is scattered, and should be done when the flowers are not quite half open. This leaves the tube open, and the pollen can be placed on the stigma with a fine brush.

The Auricula flowers from the middle to the end of April, and if cross-fertilisation is effected at that time, the seed will ripen in July, and as soon as it ripens, it may at once be sown. Use well-drained flower-pots, those about five inches diameter are as suitable as any other. The surface must be made quite level, the seed to be sown thinly, and merely covered with fine soil. Place the flower-pots in a hand-light on the north side of a wall or fence of some kind. The seed will germinate in two or three weeks, at least some of it will. A larger portion will be in the ground until February, when more seedlings will appear, and the remainder of the seed will germinate at intervals for twelve months or more. The seedlings should be pricked out as soon

as they can be handled. A medium sixty-sized flower-pot will contain twelve or thirteen of these small seedlings. They must be grown on in hand-lights or frames, and as soon as the plants have grown together, they may be repotted again, this time three plants in the same sized flower-pots. After a time they are again separated, and this time one plant only in a pot. When well established, repot again into a small forty-eight or a 4-inch flower-pot; and in this size the plants will flower. From the sowing of the seed until the time of flowering will be about twenty-two months; and it is needless to think that the time can be shortened, for Auriculas cannot be forced into flower before their time. A close atmosphere and artificial heat are fatal to Auriculas, either when in growth or in flower. If they are flowered in a house, the plants must be placed near the glass roof, and air must be admitted freely both under and over the plants. All through the growing season the plants are kept in frames, from which the lights are removed at every favourable opportunity.

General Culture.—In order to give a clear and concise account of the cultural requirements, we will suppose that it is the month of February. The Auriculas should be removed from the garden frames into the Auricula house. This is a span-roofed structure, say 10 feet wide, and any required length, with a path in the centre, and side stages about $3\frac{1}{2}$ feet wide, which will give a path of $2\frac{1}{2}$ feet. The plants are placed within 18 inches of the glass roof, or even less, and they must also be surface dressed. A portion of the old top soil is removed, and replaced with a compost of one part good yellow loam and one part of decayed manure. All offsets ought to be removed at the same time, and there is no better season of the year for planting them. They seem to do best when removed in February. Plant each offset separately in deep thumb pots, using ordinary potting mould to three parts of the depth, filling up with finely sifted sandy material. Plant the offsets firmly, and place them in hand-lights. It is characteristic of the Auricula after its winter rest to grow away rapidly, and the offsets partake of the character of the parent plants; they also grow freely and form roots more readily than at any other period. In March the trusses will rapidly develop, and to obtain the best results some care is necessary. They should be protected from the keen cutting east winds we frequently experience in March. It is well to ventilate freely, but disastrous results would follow if the ventilators were freely opened on the east side during these frost winds; and if the frosts are (as they may be) severe, it is as well to have a little heat in the hot-water pipes, for if the Auricula truss is frozen in process of development the flowers seldom open well; but beware of anything approaching to a forcing temperature, which would be sure to cause weakly, drawn-up stems and small flowers. In April the flowers develop, and in that month the Auricula exhibitions are held, and no flowers are more likely to be injured by the sun, therefore it is necessary to shade, and at the same time see that the shading is removed as soon as it is not needed. Those amateurs who intend to exhibit for prizes must have a good knowledge of particular varieties. Some will last in full beauty for three or four weeks, others will go

wrong after as many days. The selfs last but a little time in good condition, and it is really necessary to keep them out in the frames three or four weeks longer than the edged varieties, if they are to be in flower at the same time. The plants must be free from green-fly before the flower trusses appear. The amateur who delights in his plants will not fail to give them all the attention they require when they are in flower, such as careful attention to watering, protecting the delicate blossoms from rough winds and bright sunshine.

With the advent of May the blooming season is well-nigh over, and, as the flowers decay, they must be pinched off at the base of the foot-stalks, leaving the main stem to die off gradually; and the plants must be removed to the summer quarters on the north side of a wall or building of some kind, and after being in the frames for a week or two they may be repotted. The Auricula requires to be repotted once a year, and if the best results are to be obtained the sooner it is done after flowering the better.

In repotting, that very troublesome parasite, the Auricula aphis (*Trama Auriculæ*) cannot be ignored. It is to be found in every large collection, and clusters round the roots, principally amongst the drainage, and frequently round the neck of the plants. Purchase a pepper-box full of tobacco-powder, and a small brush; fill this with the powder and dust the aphis out with it. A good portion of the old exhausted soil must be removed, and the plant returned to a well-drained flower-pot, similar in size to the one it was removed from. Young, vigorous plants that may have flowered in smaller pots than are used for full-grown ones ought to receive a larger shift, but the maximum size ought not to exceed 5 inches diameter inside measure—4 inches to 4½ inches would be the most useful sizes. The potting soil should be composed of good, fibrous, yellow loam four parts, decayed manure one part, and one part of leaf-mould. This may not seem a very rich compost; but it is not well to grow the Auricula into mere leaf, as it causes the flowers to lose their highly refined character, so greatly admired by the fanciers. After repotting, the frame lights should be kept over them for a week or so, and they must also be shaded from the sun. Never shut the lights down altogether, but leave them tilted at the back; the plants will soon make roots into the new potting material, and when this has happened, air may be admitted freely. This is a point of the utmost importance, as the Auricula seldom does well unless air is admitted freely in all the stages of the plant's growth.

Insect Pests.—The ordinary green-fly is the most troublesome, and it is most easily destroyed by fumigating with tobacco smoke. The recently invented nicotine is by far the best; it is most effectual, and a second dose is seldom required. The Auricula aphis cannot live under this nicotine steam if frequently repeated, but it takes a great deal more to kill it than is sufficient for the green-fly. Slugs are troublesome, and should be killed at night when out feeding; for this purpose a good lamp is necessary. The leather-coated grub also turns out at night and feeds on the crisp tender leaves of the Show Auri-

culas. A green caterpillar also feeds voraciously on them; but this is found easily in the day time. Decayed leaves should be removed periodically, as if allowed to remain they may materially damage the plants.

A list of the best varieties may be useful (raiser's name in brackets). They are as follows:—

Green edged—Abbé Liszt (Douglas); Abraham Barker (Lord); Champion (Page); Mrs. Henwood (Barlow); Rev. F. D. Horner (Simonite); Shirley Hibberd (Simonite). The above are the six best. Prince of Greens (Trail) was much esteemed a few years ago, but owing to some defect in its constitution, it has gone a good deal out of cultivation. Grey-edged—There are a considerable number of choice varieties in this class. The best is still George Lightbody (Headly); although it was in cultivation over forty years ago, it holds its own with the best. George Rudd (Woodhead); Lancashire Hero (Lancashire); Mabel (Douglas); Marmion (Douglas); Richard Headly (Lightbody); Silvia (Douglas); William Brockbank (Mellor). Ringleader (Kenyon) in this class is still cultivated; it is the reputed parent of George Lightbody. and the best of the very old grey-edged Auriculas. In the white-edged class there are some choice and very pretty varieties, and perhaps the best is Acme (Read); it is very perfect, forms a handsome truss, and a perfect white-edged corolla. Conservative (Douglas); Frank (Simonite); John Simonite (Walker); Mrs. Dodwell (Woodhead); Ne Plus Ultra (Smith), an old variety, but very distinct, and has a pure white edge; Snowdon's Knight (Douglas); True Briton (Hepworth). The self-edged class, as previously stated, is distinct from the others. The best of them are:—Black Bess (Woodhead); Buttercup (Horner); Heroine (Horner); Lord of Lorne (Campbell); Mrs. Potts (Barlow); Raven (Simonite); Ruby (Simonite). Pizarro (Campbell) is the best of the older varieties, and at one time held first place as the best self.

Alpine Auriculas.—These are a different class of plants from the show varieties, and have been produced as garden varieties from a different parentage, probably *Primula pubescens.* They are easily cultivated, and will thrive well in the open garden, and they form as handsome rock garden plants as it is possible to conceive. No other plants have that peculiar distinct tint of crimson-maroon and blood-red shaded maroon; also the lovely lilac and purple maroon tinted colours. They are really hardy garden plants, and like a medium clay loam, with a moist subsoil in summer. The fanciers grow the finer varieties in flower-pots, and when this is done they require similar treatment to the Show Auriculas, but as neither the foliage nor the corolla has any farina upon it, the plants do not suffer from rain, and they can have what both sections appreciate greatly—abundance of fresh air; and they suffer but little from frost winds. The late Mr. Charles Turner of Slough was the first to produce choice varieties. Other cultivators have further improved the garden varieties, and there are now many choice and distinct kinds in cultivation. The best at the present are as follows:—Admiral, dark red, shading to reddish bronze; A. R.

Brown, crimson, shading to buff; Dean Hole, maroon, shading to crimson; Dreadnought, black, shading to crimson; Duke of York, crimson maroon, shaded crimson; Elegant, purple margin, shading off to pale purple; Firefly, fine form distinct, deep crimson, shading to red; Mrs. Barnett, rose and purple, shaded margin; Mrs. Harry Turner, maroon purple margin, shaded; Mrs. Martin Smith, crimson, shading to red; Miranda, darkest maroon, shaded crimson; Perfection, perfect form, dark crimson, shaded; Uranie, blood red margin, shaded pale red.

Auriculas in the Border.—Those who are unable to grow the Show Auriculas in pots, and these are only adapted for this form of culture, should raise seedlings of the ordinary border varieties. A good selection will give many beautiful forms, and one may regard them in the same way as seedling Primroses, reserving only those of pure, strong colours, and rich fragrance. Deep purple, clear crimson, yellow, orange, and similar shades are those that tell best in the garden. Freedom of growth and bloom must be considered also, and these border kinds when grown in a frame or in the greenhouse, are welcome for their sweet fragrance. In many gardens the Auricula is used with advantage as an edging, perhaps to some shrubbery border or in the spring bedding. Seeds may be sown as soon as ripe (early summer) in pans of light soil and placed in a cold frame. When the seedlings are of sufficient size plant them out; they soon grow. Seeds may also be sown in gentle heat in the early year.

Canterbury Bells.—The beginner frequently forgets that the old-world flowers—the Canterbury Bell, Pink, Carnation, and other things, are the most satisfying and ornamental. How rarely is the Canterbury Bell (*Campanula Medium*) grown in even the large garden, where one expects considerable collections of plants. The Canterbury Bells are quite easily managed. The chief point is to obtain good colours. Many recent kinds have "cups and saucers" of the breakfast pattern, but these are seldom pleasant. Their size makes them appear coarse and rough. Varieties with bloom of more reasonable dimensions are better, and be wise in the choice of colours. A delicate lavender, snow-white, soft-pink, good purple, or blue are beautiful in themselves, and the Canterbury Bell is a thing to make a group of where there is sufficient space. Avoid the double forms; they are not merely unpleasant, but hideous. The way to raise Canterbury Bells is from seed, regarding them as biennial. Sow out of doors in June, the great month for sowing biennials, and the result will be sturdy tufts for putting out where they are to flower in the following autumn. The great Campanula tribe, to which the Canterbury Bell belongs, is described at the end of the book.

Foxgloves.—The foxglove appeals to the flower gardener. We know it as a beautiful native flower, purpling with colour the woodland or grassy bank. In the small garden as well as in the large domain with woodland walks and large belts of shrubs the Foxglove will rear itself. It is a plant for a shady border where Ferns, Spanish Scillas, Day-lilies, and similar shade-loving things are happy. In many a garden such a border exists, frequently in the suburban garden, where

it is impossible to get away from trees and shrubs planted by one's neighbour to overhang the fence and cast a deep shadow across one part of the garden. There the Foxglove is quite content to flower and reproduce itself by self-sown seedlings, in truth to establish a colony. Sow the seed in May or June where the seedlings are to remain, or plant out seedlings in the autumn or in the spring. Get some seed of a strain called Gloxiniæflora, which has larger flowers than those of our native kind; it is really an improvement upon it. Many of the forms are very handsome, say a pure white bloom richly blotched inside with chocolate, dabs of dark colour on a snowy ground.

Hollyhocks.—Hollyhocks are recovering from the disease, and grouped freely make picturesque features in the border or arranged against perhaps an oaken fence or grey stone wall. All the garden forms have been derived from the species *Althæa rosea*, and remember that good living keeps the disease in check. The plants need very rich soil, plenty of manure, and when the spikes are rising liquid manure occasionally will be helpful. Stake the stems securely, and try and get varieties of a good colour. In "Wood and Garden," p. 105, it is mentioned: "Hollyhocks have been fine in spite of the disease, which may be partly checked by very liberal treatment. By far the most beautiful is one of a pure pink colour, with a wide outer frill. It came first from a cottage garden, and has always since been treasured. I call it Pink Beauty. The wide outer petal (a heresy to the florist) makes the flower infinitely more beautiful than the all-over full-double form that alone is esteemed upon the show table. I shall hope in time to come upon the same shape of flower in white, sulphur, rose-colour, and deep blood-crimson, the colours most worth having in Hollyhocks." There are several ways of increasing Hollyhocks. A very simple one is by seed, but unfortunately one cannot be quite sure that the seedlings will reproduce the likeness of the parent. Frequently single flowers occur, which though showy and beautiful, are quickly past their best, and a dingy magenta or purple is common too, a flower harsh, unpleasant, and unnatural. Seedlings are less likely to perpetuate the disease than cuttings, eyes, or root division, but when named varieties are desired, and there are still some of the old kinds in existence before the visitation of disease, by cutting eyes or roots is the way to proceed. The time to sow seed is early autumn or in February. Sow in a cold frame and in a shallow pan filled with ordinary soil. Pot off and transplant in the usual way, and when increasing by division let this be done in spring when new growth is commencing. We do not advise the amateur to raise Hollyhocks by either eyes or cuttings. When the disease appears remove all affected leaves and *burn* them, then spray the plants with Bordeaux mixture. Give an application once a week for three weeks. There are several charming species of Hollyhock—one is the single, soft yellow *A. ficifolia*. It is a fine garden plant, graceful and refined, lemon yellow in colour, sometimes almost white—a dainty plant in all ways.

Irises.—There are two groups of Iris, one bulbous, and the other is called rhizomatous; the former is dealt with in the list of bulbous flowers, and many are also considered in the tables given at the end of

BORDERING OF GERMAN IRIS BY GRASS PATH.

this work. The Flag or Bearded Iris (*I. germanica*) has many forms, which make noble groups in the garden during the early summer, succeeding almost everywhere, even upon a hot sunny dry bank, when the soil underneath is fairly rich. The best time to plant is immediately after flowering, or they may be grown too in the shade. Many a half-shady spot receives its beauty in summer from the massing together of the blue German Flag, and even when not in flower there is some charm in the silvery-toned, sword-shaped leaves. Of this group choose from amongst the following varieties:—Black Prince, a new kind, with large, fragrant, and handsome flowers, with light purple standards and darker falls, with yellow markings in the centre—the contrast between standard and fall is most marked; Asiatica, a splendid kind, strong, with spikes four feet high, and very large flowers, of which the standards are blue and the falls darker; Mme. Chereau, white, with soft bluish edges, much grown for the markets; Mrs. Darwin, standards snow white, falls white with violet reticulation, very pretty colouring; *Pallida dalmatica*, a glorious Flag Iris, perhaps the most beautiful of all, with tall stems of delicate blue sweetly-scented flowers, and broad, handsome foliage; Queen of May, pink and rose, a very quaint, pretty Iris; and Victorine, deep purple and white. The grey white Iris of Florence, or the Florentine Iris, is, except the ordinary blue, the earliest of the race. It should be grown in quite a simple group, perhaps on the lawn, or amongst dark-leaved shrubs. Coming, as it does, with the Oriental Poppies in May, it seems to be the herald of the large flowers of early summer. In the border, if of sufficient size to accommodate many things in one family, may be grownal l the best of the flag-leaved Irises, beginning in May with the old blue German. This is quickly followed by the Florentine Iris, the pale yellow Flavescens, the magnificent pale blue *Pallida dalmatica*, and the others of the Aphylla, Amœna, and Neglecta families, whose flowers are for the most part of varied arrangements of purple, lilac, and white, and numerous garden kinds, derived from Variegata and Squalens, whose flowers are yellow and crimson and of harmonious minglings of these with various tints of purple-bronze and smoke colour. The Flag Irises succeed quite well in town gardens.

Noble tall Irises besides these, but not so easily managed are:—*I. aurea*, a tall vigorous kind, with golden yellow flowers; the six-feet *I. gigantea*, ivory white and orange flowers of large size—a stately plant; *I. monnieri*, primrose yellow, reminding one of *I. aurea*, late, and appreciates moisture; *I. missouriensis*, soft blue, a very free-blooming pretty species, the common English Flag of the water-side, and its fellow variegated variety, *I. spuria*, deep blue, a tall, graceful kind; the hybrid yellow, *I. monspur; I. orientalis*, blue and beautiful pencillings of colour, a delightful Iris, very pure and charming for its blue shades; and the Siberian Iris (*I. sibirica* and *alba*), grassy plants, three feet high, with an abundance of blue flowers, ivory white in the variety named *alba*. *I. fœtidissima*, a native species, is valuable for its brilliant coral seed-pods.

Then there is a group known as the Cushion or Oncocyclus Irises, which are not beginners' plants. They come from the East, and require

thoroughly ripening off in summer. Many very beautiful kinds belong to this group, and some are strangely attractive, the big *I. susiana*, or Mourning Iris, as an example; but those who wish to know more about this fascinating section, with flowers frequently pencilled in a delightful way and gauze-like in texture, should get Sir Michael Foster's pamphlet concerning them from the secretary of the Royal Horticultural Society, 117 Victoria Street, London.

In sheltered nooks the lovely, sweet-scented Algerian Iris (*I. stylosa*, or *unguicularis*, as it is also called) and its white variety flower well in winter, and, where some slight protection is afforded, remain uninjured except by severe frosts. A mulching of some light material round the clump and an inverted hamper placed over the plant at night generally suffices to preserve the unexpanded buds—in which condition they should be cut for indoor decoration—from injury.

Since the love for water gardening and planting flowers by the stream-side has developed, the Japan or Kæmpfers' Iris has become a popular flower, not, of course, to the same degree as the Flag Iris, but in no good garden where there is a stream, pond, or water is the opportunity missed of imparting to the water margin colouring of the most beautiful and varied kind. Plant them by the margin of the water, not with their feet actually in the water; and this may be done in the autumn. The flowers are many inches across, flat patches of colour, and when there is a good selection and well planted the effect is very charming, a surfacing of varied colour, from white through purple to rose, the bloom peering above the grassy leafage. Seedlings may be raised by sowing seed in March, but this is not beginner's work.

Perennial Larkspurs (*Delphiniums*).—This is a noble group of perennial plants, strong, stately, and indispensable. In June or July the tall, handsome spikes give dignity to the garden, and the Delphiniums may be planted almost anywhere, massed or grouped in threes or fours in the mixed border, or planted amongst evergreen shrubs. There is an annual race, which are referred to in the list of this class. Many beautiful varieties of Perennial Larkspur have been raised of late years by Messrs. Kelway & Son, and others; indeed, the list has grown so long, and all the varieties possess some merit, that we hesitate to recommend any kinds where all are so good. The best way is to see a collection, if possible, or ask for a strong blue, purple, lavender, or some decided colour. A tall, cylindrical spike, so symmetrical is it, is the chief stem, and when this is removed after its beauty is over, side-growths will prolong the display. A very effective type of Larkspur is that in which the centre is blue and outer florets creamy white. More is written about Delphiniums in the list at the end of the book. It must not be forgotten that there are yellow Perennial Larkspurs—Beauty of Langport and Primrose being two of this kind. Messrs. Kelway should raise a quite snow-white flower. It must be a poor garden that will not grow Delphiniums. Like the Pæony, it enjoys a very rich soil; and, given this, and attention with regard to water during dry summers, the plants should produce sheafs of blossom. Slugs have a special fondness for Delphiniums, and, where trouble-

A GROUP OF PERENNIAL LARKSPURS (*DELPHINIUMS*).

some, strew ashes about the crowns. The way to propagate is by division of the roots, which is best done in spring as the new growth is commencing. Cuttings will root best in spring, and seed may be sown in April under glass. Sow in shallow pans, and prick off the seedlings when large enough to handle where they are to flower. It is interesting to watch the seedlings flower. They are in the nature of a prize packet.

Tree, or Moutan Pæonies.—It is strange that a race so gorgeous and effective as this should remain in comparative obscurity, as if the brilliance of its flowers were not sufficiently startling to attract the beginner, or for that matter those who would scarcely feel flattered to be described in this way. We think fashion is smiling upon the mountain group; it is quite time the pendulum of popularity swung more towards a race so easily grown and so varied in colour. The flowers are enormous, big fluttering clouds of petals, sometimes one row, sometimes two, and, of course, many in number when the variety is quite double, a glorious mass of colouring in the opening summer days. The Tree Pæony is a shrub, and should be grouped upon the lawn, exposed to the south but not to easterly winds. That is the secret of success—judicious shelter without in any degree coddling up. A rich soil is also essential; it must be deeply trenched, well manured, and give plenty of water during the summer. We have seen Tree Pæonies in a hot dry border, and then the owner grumbles that the big flaunting flowers seen at the early shows will not venture forth. Of course not, when the plant demands opposite conditions, moisture and manure. When the border is dry the places where the Pæonies are to go must be specially prepared. Avoid shade, for the reason that full ripening of the growth is necessary to abundant flowering. The time to plant is just when the flowers have faded. Of the many good plants we have had from China, none is of more importance than the Tree Pæony. It is very useful for forcing gently into bloom in pots. Rich feeding is essential, but it is worth some effort to get the beautiful flowers in February and March. After flowering give the plants a year's rest before again submitting them to pot culture. There are so many varieties that it is not easy to make a selection without omitting some kind that deserves attention; but the following are very beautiful:—Aphrodite, white; Duchess of Marlborough, flesh colour; Eastern Prince, deep scarlet, with golden anthers to intensify the dark colouring; James Kelway, rose, carmine centre; Beauty, rose-lilac; Lord Byron, salmon-rose; Reine Elizabeth, pink; Atalanta, purple-red; Berenice, white-carmine. These are double; and of the singles choose:—Cecil Rhodes, with fringed crimson and cerise florets; Lord Kitchener, blood-red; Countess Crewe, salmon-pink; Henry Irving, maroon; Lord Iveagh, rose; Mr. W. J. Simcox, rose touched with salmon; and the deep crimson, almost waxy-petalled Eastern Queen.

Chinese, or Herbaceous Pæonies.—Unlike the Tree Pæonies these die down every year and spring up again in the following year as the ordinary perennial plant of the border. The Herbaceous Pæony is a fine picture in every well-planted garden—the old crimson Pæony

tumbling over the border margin or forming groups in the woodland, a luxuriant, crimson-stained perennial as sumptuous as anything raised of recent years. The soil cannot well be too rich for the Pæony; and it pays in the long run to make a bed fully three feet deep for the plants, and put in plenty of decayed cow manure unless the soil is very heavy. Unlike the Tree Pæony, the herbaceous form appreciates some shade, and the flowers remain longer fresh and full of colour when not exposed to full sunshine, but planting against hungry shrubberies is a mistake. The month to plant Pæonies is September; it may be accomplished at other seasons, but this is the most appropriate, though they are in full leaf at the time. When planted or transplanted at this time, the Pæony quickly becomes established, sends out new roots, and is enabled to go through the winter with safety. A wrinkle when planting in dry soils is to leave quite a little depression round the crowns, so that water when given may sink thoroughly to the roots, and not run off, as is the case when planting quite on the level. Also give a surface mulch of well-decayed manure in spring, to prevent parching winds and hot suns drying up the moisture in the soil. Never put a Pæony less than a yard from another plant, as they are so leafy and shrubby that when closer together overcrowding is the result. When a bed entirely of Pæonies is planted the surface has a bare look, but this may be remedied by planting Pansies between, or some evergreen, such as the mossy Saxifrage (*Saxifraga hypnoides*). Frequently four years elapse before the Pæonies attain their full blossoming perfection. The crimson shoots in spring are very charming, and a pretty colour contrast results by putting yellow Daffodils between, whilst Lilies may be used in the same way. There are two distinct classes of Pæonies, the May flowering and the more popular forms of *P. albiflora*. Of the May blooming group, select from the single red-flowered *P. anomala*, which has also very prettily cut foliage, and there are many fine varieties of crimson-shaded colouring. *A. arietina*, and its varieties, are beautiful too, but of the species a list will be found at the end of the book.

P. albiflora, the parent of the most familiar Pæonies of the day, has single white flowers relieved by a central tuft of golden stamens. It is in brief a flower of dashing beauty, but the varieties offer a charming colour-range, from white through rose, flesh-pink, purple, red, to full rich crimson. A selection may be made from the following:—Agnes Barr, rose-white; De Candolle, rose-pink; Eugene Verdier, blush; Festiva maxima, pure white; Lady Beresford, pink; Lord Salisbury, crimson; Mme. Furtado, rose; Mme. Calot, white, rose shading; Princess Clothilde, flesh-colour; Solfaterre, sulphur; Triomphe de Paris, white; and Whitleyi, yellowish white, a very beautiful Pæony. These are all double varieties. A few good singles are:—Angus, rose; Duchess of Sutherland, flesh; Queen of May, rose; The Moor, crimson, touched with maroon; Venus, rose; and Water Lily, pure white.

Pansies (*Violas*).—The show and fancy Pansies cannot be regarded as flowers for the beginner's garden, and they are seldom satisfactory in the South of England, but of late years many beautiful varieties have been raised, known collectively as tufted Pansies, the

TREE PÆONY BUSH.

older name for which was Viola. These flower over a longer season than the Heart's-ease of our forefathers' gardens; big, handsome flowers, that seem to smile in the sunshine of summer. We admire these fine garden flowers, and by raising seedlings many beautiful forms may be obtained, offering a remarkable range of colouring from selfs through blotched and other forms, some almost bronze, others picturesque mixtures, in shading almost black, so intense is the purple tone.

But to create certain effects, to obtain masses of colour and pretty bouquets for the table, it is better to grow a few of the best tufted Pansies. There is nothing in the least degree difficult in their management. Cuttings may be taken in July, inserted in a bed of soil in a cool part of the garden, say a north or east aspect—anywhere, in fact, away from the full force of the midday sun. Cuttings put in during July will root sufficiently to transfer to the places they are to adorn in the following autumn. For spring planting insert the cuttings in the autumn, and protect them with a rough framework of eight-inch or ten-inch boards. Use the ordinary soil of the garden for the cutting bed; dig it deeply, and well break it up, then spread over it a compost consisting of loam, leaf-mould, and spent mushroom bed manure in equal parts. Add to this an equal part of coarse silver sand or coarse road grit. Mix the compost well together, pass it through a sieve with a half-inch mesh, then spread it evenly over the place for the cuttings. Level the soil and make it moderately firm with a board or back of the spade. An hour or two before the cuttings are inserted water the soil thoroughly with a fine rose watering-can. The cuttings should be made of recent growths, not pithy hollow stems; let them be about two inches and a half long, remove the two lower leaves, and cut straight across the lower joint with a sharp knife. It is important, if possible, to obtain the cuttings with a few small roots attached, such as may be obtained when taking from the old stools. Put the cuttings two inches apart in rows. Make them firm at the base; the rows to be three inches apart as a rule, but some varieties, being weaker than others, require less space. When the cuttings are inserted water them gently. In about three weeks the cuttings will have rooted. The large grower cuts back the plants to secure cuttings or new growths, but those who require fewer tufts need not interfere with the free-flowering of the Pansies. As opportunities offer detach young growths from the crown of the plants and root them, and in many gardens where space is limited a small batch of plants may be raised in wooden boxes three inches or four inches deep, or in pots, placing them in a cool position when propagation takes place in summer, or under a south or south-west wall if propagated in the autumn.

There are two seasons for planting Pansies—autumn and spring. When a very early spring display is required, plant in autumn, say in early October. Choose a warm sheltered spot if possible. Plant them firmly about ten inches apart, well working the soil round the collar of each tuft, and put them a foot apart, not more, and then the intervening space will be quickly covered. Dig deeply the bed or

border where the Pansies are to go, incorporating partly-decayed manure, and if the soil can be left rough for rains and frosts to sweeten it, so much the better. Where more than one colour is associated in a bed avoid violent colour contrasts, but secure a pleasing sequence. When planting in spring choose early March, and then the Pansies get established before the hot weather. This does not mean that planting cannot be done in April, or even in May; but March is the most suitable time. Always dig the soil deeply, and remember that the Pansy is not happy in very heavy ground.

Plants sent from a distance usually arrive without soil at the roots, and need careful treatment. If they appear shrivelled stand the little packets in flower-pots (leaves, of course, uppermost), and sprinkle them with water, and place in a shady corner for a few hours to recover. Pansies dislike hot sunny places. They delight in coolness and shade; important points to remember. During the summer, hoe carefully amongst the plants to break up the surface soil, keep down weeds, and always remove spent flowers. When a plant begins to mature seed its blossoming is at an end; it cannot bear the double burden. When the weather is very hot, water the plants thoroughly and spray them occasionally in the evening. It is wise also to mulch the tufts in June, using for the purpose leaf-mould and loam in equal parts with a free use of coarse sand or road grit. Well work the material round the collar of each plant. Two or three times during the flowering season it will be wise to give the Pansies a short rest by pinching off all the buds and blossoms, and within a week another display will reward the attentive gardener. Cut out old, coarse, and elongated growths from time to time. This will promote younger shoots.

Pansies may also be raised from seed, which should be sown out of doors in a shady place in August, pricking the seedlings out to a specially prepared bed in October. The plants will flower during the following spring. The seed may also be sown in gentle heat in the spring, pricking the seedlings off into shallow boxes, and then transfer them to the beds or borders when they attain sufficient size. Remember only to purchase the best seed, *i.e.* that raised from the most beautiful varieties.

Pentstemons.—It would be difficult to select a gayer or more interesting group of garden flowers than the Pentstemon. There is something refreshing in their appearance towards the end of summer, when even a weakly plant will attempt a brave show of spikes of bloom, each flower of an open bell-like formation, reminding one of a Foxglove. Remember, however, that the Pentstemon is decidedly tender, a hard winter will kill the plants wholesale; but that is of small importance, as seedlings may be raised with great ease, indeed, we may quite regard the plant as a biennial—*i.e.* seedlings flower the year after the seed is sown, in contrast to the annual, which flowers the same year. Remember the seasons for seed sowing—one in June, in shallow pans, the seedlings to be wintered in a frame, and the other, which is the more convenient when space in the little greenhouse is precious, in January. Sow upon a hot-bed or in a temperature of between 50 deg.

THE MOSSY PHLOX (*P. STELLARIA*).

and 60 deg. in a pot or shallow pan of light soil. Prick off the seedlings in the usual way, and plant out in May. Take cuttings of moderately ripened shoots in autumn and winter them in a frame, and plant out in April. There are named kinds, but the beginner will rest content with seedlings of pure good colours. A variety with a pure white throat and clear colour upon the face of the flower is very effective. Avoid the dingy purple, or anything approaching magenta, but there are many delicate tones in the race.

Perennial Phloxes.—There are two groups of Phloxes—the one called the mossy, Alpine, or cushion Phloxes, so useful to form carpet plants or a groundwork to Daffodils, Colchicums, and other flowers, besides being brilliant with colour when flowers surface the growth; and the other the Perennial, or Herbaceous section. The Perennial Phlox is a glorious flower. It must be planted in the small garden in the border, because there is nowhere else to put it, but in large places it may be planted amongst shrubs, or by the water side, where it delights in the moist rich soil. This is the keynote to success —a rich soil. In a garden never manured, especially if dry and exposed entirely to the full sun, Phloxes are unhappy, they soon get leggy and leafless; but it is so easy to mulch with manure and water freely that there is no excuse for poor growth. Plant healthy tufts in spring when growth is commencing, or in autumn. After having been about three years in the same place the growth becomes matted; it is in truth starved, and then is the time to break up the clumps and replant elsewhere, or in the same place after it has been enriched. This taking up of the plants and pulling them apart is called propagation, and this is the easiest and surest method of increase. If one desires a few cuttings from a neighbour who is blessed with plenty of Phloxes and does not care to disturb the crowns, ask for them in the autumn, put them into five-inch pots (round the sides), and when rooted pot off singly; they will root in a warm greenhouse. Of course, Phloxes may be raised from seed, but this is not a beginner's task. The following are a few of the best; all will not be required in the small garden, but any one of them may be chosen:—Avalanche, pure white, dwarf. Coquelicot may be described as orange-scarlet with a touch of salmon in it; a brilliant flower, shapely, and effective. If the writer were asked to choose one Phlox it would be Coquelicot, so strong, tall, handsome, and telling. Etna is a colour that is unmistakable, a warm crimson-scarlet, *i.e.* neither one nor the other. Jeanne d'Arc is a pretty dwarf, white-flowered variety. La Candeur, also white, with cherry-coloured "eye" in centre. W. Robinson rosy-salmon, tall. Eugene Danzanvilliers, lilac, medium height. John Forbes, rose. Of course there are many more Perennial Phloxes, but these should satisfy ordinary requirements.

Pinks.—The good gardener, amateur or otherwise, will make full use of the pink, pure white fragrant flowers inseparable from the old English garden. We confess a strong love for the common white Pink, so indispensable in its pretty modest beauty and its incomparable sweetness. Every year as its flowering time comes round one greets it as one

of the old treasures most to be loved and prized. Nothing is a prettier edging to a walk, for even when the bloom is over its neat tufts of bluish foliage are charming; and it should not be forgotten that in winter the leafy tufts are at their best. This old favourite has been overshadowed by the larger-flowered Mrs. Sinkins, Albino, Mrs. Lakin, Her Majesty, and Snowflake. Mrs. Sinkins is the variety more largely planted, we think, than any other; its double white flowers are filled with perfume. Albino and Mrs. Lakin we appreciate also, and their flowers are less apt to split than those of the more bulky varieties. Every fat Carnation or Pink flower generally splits its calyx. Pinks must not be planted in a soil likely to contain wire-worm, otherwise the tufts will disappear wholesale; but ordinary soil will suffice, not wet or badly drained, however. The mauve-tinted Souvenir de Sale is very pretty, but splits rather badly; and one named Ledham's Favourite is more lasting than the others. Besides the true garden Pinks a charming group is known as the "laced" kind, an appropriate name indicating that the colour is laced upon the pure white ground. When show Pinks were more fashionable than they are at the present day their merits depended in a large measure upon the purity and perfection of their lacing. Pinks are so quickly and easily propagated by cuttings or pipings that a few words will suffice to dismiss this subject. June is the month for the work. Cut them just under a joint, remove the required number of leaves to ensure a clear stem for insertion in the soil, and dibble them in a shallow box of light soil or in well-drained pots. Put a hand-light over the cuttings if they are rooted in the open ground, and plant out in the autumn. Some growers layer them much in the same way as the Carnation is increased. Another simple way is, in the autumn when the clumps have become matted, to simply part them and get several healthy little tufts.

Poppies, Shirley.—This race of annual Poppies has been singled out for special reference. One of the first garden flowers chosen is the Shirley Poppy, with its delicate colouring and pretty shape. Other annual Poppies are described elsewhere, but the "Shirley" race deserves a paragraph completely to itself. It will interest gardeners to know the origin of this dainty race. They were raised by the Rev. Mr. Wilks, Vicar of Shirley, near Croydon, and secretary of the Royal Horticultural Society—hence the name. Mr. Wilks says: "My name may have become known throughout the world as secretary of the Royal Horticultural Society, but my Shirley Poppies are even more widely known, and that far more deservedly, for there is no country under the sun (except perhaps Patagonia and Thibet) to which I have not sent seeds gratuitously, and I am told that in the streets of Yokohama and of Rio, of Vancouver and of Melbourne, of Paris, Shanghai, and Berlin, of Cairo, Philadelphia, and Madrid, Shirley Poppies are freely advertised for sale. They arose in this way: In 1880 I noticed, in a waste corner of my garden abutting on the fields, a patch of the common Wild Field Poppy (*Papaver Rhœas*), one solitary flower of which had a very narrow edge of white. This one flower I marked, and saved the seed of it alone. Next year out of perhaps two hundred plants I had four or

PRIMROSES IN A SILVER BIRCH WOOD.

five on which all the flowers were edged. The best of these were marked and the seed saved, and so for several years, the flowers all the while getting a larger infusion of white to tone down the red until they arrived at quite pale pink, and one plant absolutely pure white. I then set myself to change the black central portions of the flowers from black to yellow or white, and having at last fixed a strain with petals varying in colour from the brightest scarlet to pure white, with all shades of pink between and all varieties of flakes and edged flowers also, but all having yellow or white stamens, anthers, and pollen, and a white base. . . . My ideal is to get a yellow *P. Rhœas*, and I have already obtained many distinct shades of salmon. The Shirley Poppies have thus been obtained simply by selection and elimination. By 'selection' I mean the saving seed only from selected flowers, and by 'elimination' the instant and total eradication of any plant that bears inferior flowers. . . . Let it be noticed that the Shirley Poppies (1) are single ; (2) always have a white base, with (3) yellow or white stamens, anthers, or pollen ; (4) never have the smallest particle of black about them. Double poppies and poppies with black centres may be greatly admired, but they are not Shirley Poppies." It is rather interesting to reflect that the gardens of the whole world—rich man's and poor man's alike—are to-day furnished with Poppies which are the direct descendants of one single capsule of seed raised in the garden of Shirley Vicarage so lately as August 1880. Poppy seed should be sown in the autumn or in the spring, sowing very thinly because the seed is small, and thinning out the seedlings to fully six inches apart. Fine flowers in abundance and over a long season can never be expected unless the seed is sown thinly, the seedlings well thinned out, and the dying flowers picked off to prevent seed forming and weakening the plant."

Poppy Anemones.—This is a beautiful group of Windflowers or Anemones (*A. coronaria*), and such races as that known as St. Brigid comprise flowers of wonderful colouring—white, purple, rose, violet, and many other shades, laid upon broad, robust segments. There are single and double forms. The seed should be sown about April or in June. When this is saved, not purchased, separate it well before sowing by mixing it with an equal quantity of silver sand. The seed-bed should be made of a fairly porous soil, and placed in quite an open spot. Make the surface quite firm and level, and well moisten the ground, if dry, before sowing. Sprinkle the seed with fine soil, make the surface smooth, and shade with evergreen shoots until the seedlings appear, when no further shading will be needful. Keep the bed moderately moist until growth is finished. Poppy Anemones may also be planted in autumn. The June sown seed will give plants for flowering in the following spring. Whilst writing of this Anemone mention must also be made of the brilliant crimson *A. fulgens* (Scarlet Windflower), and the variety *græca* is even brighter than the type.

Primroses and Polyanthuses.—The Primrose in its many forms is a flower for all gardens. All the varieties are derived from the wild *Primula vulgaris* of grassy banks and copse. Raising seedlings is a very interesting pastime, and the seed germinates readily when sown in May

or June in a cold frame, or even in the open ground, but when in a frame the seedlings are more under control. When selecting the seedlings to keep during their flowering time reject all of poor colouring. Magentas and unpleasant purples will frequently occur, and these are amongst the most disagreeable colours in the garden. Pure white, pink, deep crimson, clear yellow, or any good self shades are welcome. Miss Jekyll, in "Wood and Garden," alludes to the beautiful bunch Primroses, which are such excellent garden plants, as follows:—"The big yellow and white bunch Primroses are delightful room flowers, beautiful, and of sweetest scent. When full grown the flower-stalks are ten inches long and more. Among the seedlings there are always a certain number that are worthless. These are pounced upon as soon as they show their bloom, and cut up for greenery to go with the cut flowers, leaving the root-stalk with its middle foliage and cutting away the roots and any rough outside leaves." And at p. 216, in a charming description of the "Primrose Garden" at Munstead, this useful type of garden flower is fully described. The Munstead Primroses "are, broadly speaking, white and yellow varieties of the strong bunch-flowered or Polyanthus kind, but they vary in detail so much, in form, colour, habit, arrangement, and size of eye and shape of edge, that one year thinking it might be useful to classify them I tried to do so, but gave it up after writing out the characters of sixty classes! Their possible variation seems endless. Every year among the seedlings there appear a number of charming flowers with some new development of size, or colour of flower, or beauty of foliage, and yet all within the narrow bounds of white and yellow Primroses. Their time of flowering is much later than that of the true or single-stalked Primrose. They come into bloom early in April, though a certain number of poorly developed flowers generally come much earlier, and they are at their best in the last two weeks of April and the first days of May. When the bloom wanes, and is nearly overtopped by the leaves, the time has come that I find best for dividing and replanting. The plants then seem willing to divide, some about falling apart in one's hands, and the new roots may be seen just beginning to form at the base of the crown. The plants are at the same time relieved of the crowded mass of flower-stem, and, therefore, of the exhausting effort of forming seed, a severe drain on their strength. A certain number will not have made more than one strong crown, and a few single-crown plants have not flowered; these of course do not divide. . . ." Writing of the time of sowing the seed, the author says: "As nearly as I can make out, it is well in heavy soils to sow when ripe, and in light ones to wait until March. In some heavy soils Primroses stand for two years without division; whereas in light ones, such as mine, they take up the food within reach in a much shorter time, so that by the second year the plant has become a crowded mass of weak crowns that only throw up poor flowers, and are by then so much exhausted that they are not worth dividing afterwards. In my own case, having tried both ways, I find the March sown ones the best. The seed is sown in boxes in cold frames, and pricked out again into boxes when large enough to handle. The seedlings are planted out

THE DOUBLE WHITE SWEET ROCKET.

in June, when they seem to go on without any check whatever, and are just right for blooming next spring." These remarks by an authority upon the subject must be helpful to my readers. The bunch-flowered Primroses are of many colours, soft and dainty tones, pure white, intense orange, and so forth.

Mr. G. F. Wilson of Weybridge has raised a race of blue Primroses, not the blue of the Gentian, but a very beautiful series of colours, sometimes purple blue with crimson eye, and several of the varieties have been named, such as Oakwood Blue, all being well placed against moss-covered stones to bring out the distinctive flower colouring. A deep red or crimson is a good colour to obtain.

The double Primroses are not easy to manage. They are more successful in a moist climate, such as that of Ireland, than in drier positions. The old Pompadour, a perfectly double crimson flower, is delightful; it is a quaint, old-fashioned primrose, and happy is he who can get large tufts of it. Unfortunately it is not a success in the south. This variety, more than any other, requires a moist climate and cool soil. Double lilac, lavender, white, and yellow, are very charming also.

The Polyanthus is a form of the Primrose, and may be grown in the same way. It is not so effective in the garden, but good colours occur in a well-chosen selection, and the gold-laced, hose-in-hose, and other old forms are very quaint.

Rockets, Sweet or Double.—These are delightful, old-world flowers, filled with fragrance. A famous grower of them in Ireland, the Rev. Denis Knox of Virginian Rectory, says, in the *Garden*:—"I at present possess in quantity six varieties: the French white; the Scotch, or Eglinton, as it is often called (this kind has, I may say, always a quaint trace of lilac at the top of its spike); the true old pure double white; the pale lilac, the most vigorous grower of all; the true old lilac, now nearly extinct (I was searching for it for thirty years, and at last discovered it, to my great joy, in an old garden in Westmeath); and the lower-growing, shorter-spiked purple. This, I recollect, used to be called Parkes' Rocket. . . . I have had (in a place I lived at thirty years ago) the old pure white and the old lilac twenty-four inches in spike. Here I have never gone beyond nineteen inches. Many people make the mistake of allowing the side shoots to remain on. This gives the plant rather a weedy appearance, and, of course, takes from the length and majesty of the main spike. Double Rockets are essentially plants for rich, deep, moist soils. They are plants that cannot be left alone, or left long in the same soil. Every third year, at least, they should be taken up and divided, placed in new soil, with which plenty of well-rotted cow manure and some lime rubbish have been incorporated. They strike very freely from cuttings put down as soon as they begin to push in the spring, but they divide so satisfactorily that now that I have plenty of them I do not go to the trouble of making cuttings. They have an enemy in the shape of a nasty white grub, which attacks them and eats out the blossom-spikes when they are about nine inches or so high. It must be searched for and destroyed. The curling of the leaves infallibly shows its presence. It would be, indeed, a pity

were such delightful flowers as double Rockets to pass out of existence. We have to deplore the loss to the world of several favourites which I remember long, long ago. I may mention the white Hepatica and the double white Primrose."

Stocks.—Stocks are amongst the most popular of flowers, and no wonder, when their beautiful colour and delicious fragrance are remembered. Moreover, they are of easy culture, so that amateurs can grow them to perfection. Planted in beds, such choice colours as scarlet, white, rose, and purple, are very telling, and borders, composed of half-a-dozen or more distinct colours, are also charming, and last in full beauty for a long period.

The *Ten-Week Stock* is the most popular, and is quite easy to grow. The seed may be sown at any time from February to May, March being the best month. Sow in shallow boxes or pans, in a compost of light loamy soil, leaf-mould, and silver sand, covering the seed lightly, and making the surface firm and level. Sprinkle with water from a fine rosed can, and stand the boxes or pans in a warm moist house or frame. A temperature of 55 deg. is suitable. When the seedlings appear admit air liberally but cautiously, and water them carefully, as if kept too wet they will damp off. When the young plants can be handled, prick them out into other boxes and place them in a sunny frame, shading them from bright sunshine, giving them as much air as the state of the weather will allow, and keeping the soil comfortably moist. Thus treated they will grow quickly and strongly, and will be ready for planting out in open beds or borders early in May.

Stocks require good rich soil, which should be made firm by treading, and the seedlings should be planted nine inches apart, and the soil pressed firmly round the roots. In planting amateurs often err in selecting only the tallest and strongest plants, and discarding the dwarfer ones. The latter generally have the most fibrous roots, and as a rule produce a far greater percentage of double flowers than the former. After planting, mulch between them with very short stable litter or old mushroom bed manure, and well soak the ground with water. The mulching will keep the roots cool and moist in hot dry weather, and this is of the greatest importance. When in active growth water them, say, once in ten days with weak manure water, or sprinkle a little artificial manure on the surface and water it in. For a late autumn flowering batch seed may be sown in a warm frame in the middle of April. Sow the seed thinly, thin out the young plants freely, and encourage a rapid and vigorous growth by a liberal supply of moisture both at the roots and in the atmosphere.

East Lothian Stocks are very beautiful, and perhaps the most fragrant of all. They require rich soil and good cultivation, but are extremely hardy. Seed for the earliest batch of plants should be sown under a hand-light or in a frame in a partially shaded portion. Sow very thinly, and thin the young plants out to two inches apart when large enough. Keep them well-watered and aired, and when the second pair of rough leaves are formed pot them into small pots in good loamy soil, a little well-rotted manure, and some coarse sand. Stand them on ashes in a

SOLOMON'S SEAL IN HALF-WILD GARDEN.

sunny, open position, removing them to a cold pit or frame in November, and exposing them fully in fine weather. Protect from severe frost with mats, and keep the soil in the pots on the dry side during winter. Assist with weak liquid manure-water in spring and plant them out in a bed or border in deeply-dug, well-enriched soil at the beginning of April. Mulch and keep the roots moist and they will grow into dense plants, and present a gorgeous appearance throughout June, July, and August. A portion of the plants may be potted into 4½ or 6-inch pots and allowed to bloom there. If kept in a quite cool temperature they will flower profusely and make a brave show in the greenhouse or conservatory in May and June. Seed may also be sown in gentle heat in March or April, and the plants treated as advised for the Ten-Week Stock. The colours of the flowers are crimson, scarlet, white, and purple.

Giant or Brompton Stocks have the finest spikes of bloom, often from fifteen to eighteen inches in length, and very massive; the plants being quite hardy may be grown by those who do not possess a frame. Sow the seed in fine soil in a cool sheltered place out of doors early in June, prick out the young plants when large enough and plant them in their final quarters in August. They must have a sheltered nook or corner, and be planted in rich loamy soil. Give them plenty of room, and if the winter is not exceptionally severe they will make a brave show in May.

Solomon's Seal.—This graceful plant is always welcome. It delights in partly shaded garden borders, in nooks amongst shrubs, and the edges of woodland. It may be grouped with the poet's Daffodil and such wood-loving plants as Lily of the Valley. Solomon's Seal has a way of growth and a kind of beauty that are entirely its own. The stem rises nearly upright and then bends over in a flattened arch that admirably displays the clusters of greenish-white bell-flowers that spring from the axils of the leaves. It is quite one of the best plants to put in shady corners.

Sunflowers.—The Sunflower is as familiar in the garden as the crimson Pæony or clove Carnation. A child can grow a Sunflower, because it only wants soil of some kind and sunshine. There are two distinct groups, annual and perennial. The annual Sunflower is *Helianthus annuus*, of which there are many forms, some with huge double flowers, others of the same dimensions but single, and a few quite dwarf in comparison, the bright apple-green leaved, yellow-flowered *H. cucumerifolius* as an example. But one of the prettiest of all annual Sunflowers is called Primrose or Primrose Dame; the flower is not over large or coarse, and the plant is not more than three, or in strong soils three and a half feet high, its colour is clear primrose yellow, set off with an almost black centre. A group of this is charming, there is such a soft, refined contrast between the centre and outer florets.

For the quite small garden and larger places to form free graceful groups of colour in the autumn the perennial Sunflowers are of most value, and several varieties have been raised of recent years. This group is conspicuous for its graceful growth, tall willowy stems of yellow flowers; and they are so robust that the roots run here and there and

everywhere, leaving one spot when the soil is exhausted to find fresh pasture. Some are more aggressive than others, the variety raised by the artist Mr. H. G. Moon, and named after him, not having this characteristic so pronounced as many others. The common kind is *H. multiflorus*, which has long remained a good border flower; and its variety *fl. pleno*, which has quite double yellow flowers, is as well known. These are not so tall or willowy as *H. decapetalus*, which will reach a height of about six feet; *H. giganteus*, *H. lætiflorus*, *H. orgyalis*, a very graceful and beautiful flower, and *H. rigidus* (Miss Mellish). The last-named is about six feet high, very strong, leafy, and with large flowers. A group of this upon the lawn is very handsome in the autumn. We have seen the perennial Sunflowers made excellent use of for planting up ugly corners, and where more delicate perennials would fail. The plants are easily increased by division of the roots in spring, when new growth is beginning.

Verbenas.—Flower lovers rejoice in a revival of the Verbena, one of those good plants almost annihilated by fungoid disease, the result of weakened growth through over-propagation, or propagation in forcing temperature to insure quick rooting of the cuttings. Of course the Verbena is not a hardy plant, but it is much too good a thing to be allowed to pass into disuse. Some of the old self-coloured varieties are still to be had; and those with a scarcely defined eye, or very small white eye, are much to be preferred to those of more recent raising with large white centres. The large white eye spoils the plants in the mass—and the Verbena is essentially for massing—a chopped-up look that certainly detracts from its use as a garden plant. The danger with the garden varieties is that of getting them too large and coarse. What is wanted is strong constitution and short growth. Seed can be obtained in mixed or in distinct colours—that is, a packet of a certain colour will produce it in the seedling. Always choose as mentioned good selfs, pure clear shades, nothing "spotty" or crude. Seedlings are unquestionably stronger than cuttings. Sow the seed in March thinly in shallow pans, well drained and filled with sandy soil. It is well where seeds are few to make shallow holes equally all over the surface of the soil with the point of a finger and to put the seed into each, as the plants later on get plenty of space. They become quite strong before it is needful to dibble them off into other pans, or shallow boxes, or singly into small pots before planting out in May. A temperature of about 60 degrees is necessary for raising the seed. Of course, in the case of named varieties, it is necessary to raise them from cuttings, and a variety called Miss Willmott, with large rose-pink flowers, must be treated in this way. Then we have Snowflake, Purple King, and others, the pride of our grandfathers' gardens. Cuttings of Verbenas should be put in a cold frame in August, or even a bell-glass will suffice. Select young, strong, healthy shoots without flower buds. One may use either a shallow pan or a pot for the cuttings. Put them two inches apart, and keep them near the glass in a temperature of 45 degrees, not more. Under these conditions and very careful watering, there should be little damping off or mildew. Cuttings in a temperature of 60 degrees strike easily in spring.

A BORDER OF HARDY FLOWERS AND STONE EDGING.

THE MIXED BORDER

In the gardens of to-day the mixed border is not forgotten. In it are plants that remain beautiful for a longer period than beds filled with summer-flowering plants, bright for a few short weeks. Moreover, the possession of a beautiful mixed border is not exclusively confined to the wealthy, for the humblest amateur or cottager may produce the most delightful pictures without the aid of a single pane of glass in the rearing or winter-protection of his favourites, whereas in the culture of bedding plants glass shelter is essential during the winter and spring. Where the larger herbaceous subjects are under-planted with bulbs, clumps of Snowdrops poise their white, drooping flowers above the bare earth in the earliest days of February, followed by the golden Crocuses and blue Glory of the Snow (Chionodoxa), spring Snowflakes and Daffodils, yellow and white. As the season advances the border gains in beauty day by day, and loses but little of its attractions in the autumn months, when the perennial Sunflowers, Michaelmas Daisies, Dahlias, Sternbergias, Autumn Crocuses (Colchicum), and other late-blooming flowers make breadths of colour, followed later by the winter-blooming Algerian Iris (*I. stylosa*) and the Christmas Rose. As regards the dimensions of the mixed border, it must be impressed upon the amateur that want of space should not deter him or her from proceeding with its formation, for even in a plot ten feet by two feet it is quite possible to provide a pretty show of colour and form. Where space is no object, a border twelve feet or fourteen feet in breadth by one hundred yards in length may well be arranged for; but, whether large or small, its formation should be proceeded upon with equal care. There is, unfortunately, a very general impression amongst amateurs that hardy plants, of which the mixed border should mainly consist, being hardy, can grow anywhere, and are indifferent to such matters as soil, situation, and ordinary attention. This, however, is far from being the case, and where, under this belief, they are planted in shallow, hungry soil, in dense shade, in exposed, wind-swept positions, or are left with their wants unprovided for, failure is certain to ensue. The aim of the

true lover of the garden should be the attainment of the fullest perfection of vigorous health in each plant grown, and for this reason the border should be well made and thoughtfully planted. To secure the best results

The Soil must be deep, rich, and well drained. In shallow soil the roots of the plants are parched in hot summers, in poor soil stunted growth proclaims lack of vigour, and where stagnant moisture lies about the roots in the winter those plants that do not perish lose vitality. To construct a mixed border close to a hedge is courting disaster, for the hungry roots of the Laurel, Privet, Yew, or Thorn, of which it is composed, soon appropriate with their all-pervading fibres the sustenance provided for the herbaceous plants, and thus effectually prevent them from attaining their rightful proportions. The most suitable soil for the border is sound, fibrous loam; but this is, in some localities, difficult to obtain, in which case the best must be made of what is nearer at hand. Both heavy and light soil can be so modified by additions as to render each capable of growing well the bulk of the plants requisite for the mixed border. Thus heavy soil may be lightened by a liberal addition of road-grit, old mortar-rubbish, burnt earth, wood ashes, and coarse sand, which will tend to render it porous, while light soil can be given greater sustaining qualities by an admixture of leaf-mould, decayed vegetable refuse, well-pulverised clay, and a small proportion of peat. The border cannot well be too deep. Three feet is none too deep for many of the stronger-growing herbaceous plants, which send their roots downwards to a great distance. At all events, a depth of two feet should, if possible, be secured. The early autumn is the best time for making the mixed border, as it is then ready for the reception of the plants during the month of October. After seeing that adequate drainage is provided where the soil at the bottom of the bed is of a retentive nature, the border should be filled in with the prepared soil, the lower half being plentifully dressed with fresh manure, farm-yard manure being used in light soils and stable manure in heavy. The upper half of the border should also be given a liberal addition of manure, but this, with which the roots will first come into contact, should be well-rotted and not fresh as advocated for the lower half. With herbaceous plants a good start is more than half the battle, and when placed in such a border they will grow vigorously from the first and attain their fullest development, a result that is not to be anticipated where they are planted in borders not richly stored with food. During the winter a mulch, or covering of some light material that is not liable to become sodden or

ARCHES OF CLEMATIS AND MIXED BORDER.

"cake," will help to keep the warmth in the soil about the roots, while a mulch of light manure in the spring, when the root-fibres are stirring, will both provide them with nourishment when the manurial agents are washed into the ground by heavy rains and tend to keep them cool, and the ground from cracking during the summer heat. A slight sprinkling of earth over the mulch prevents it from being unsightly.

Planting the Border.—Care should be taken that the roots are well spread out and covered with fine soil. This is too often neglected and the plants hurriedly pushed into holes in the ground with their roots in a tangled ball, this naturally retarding the start into growth in the spring, and giving the thoughtfully planted example an advantage which it generally retains during the whole of the first season. After planting, the soil should be made firm round the roots, and during the first winter should hard frosts occur, as these often loosen the soil. If this is overlooked the roots frequently suffer from subsequent severe weather. Mixed borders should not be planted in lines and patterns, but the plants arranged in informal groups varying in size and shape. When treated in this manner the breadths of colour give the border the natural effect that should be aimed at. Tall subjects should as a rule be placed at the back, and those of lowliest growth in the front, but it is well, here and there, to allow a group of taller plants to occupy a forward position among their dwarfer companions since this adds to the charm and informality of the border. Single plants should never be dotted about promiscuously, as is too often the case, as this results in a spotty medley of hues. The question of colour is one that should be considered at planting-time, care being taken to associate only such plants as are harmonious in their tints. Scarlet should be kept away from rose-purple, but scarlet and crimson blend well with orange and yellow, while purple and blue merge into pale lavender and white. Plants that flower early in the summer, such as the Oriental Poppy and the Lyre Flower (*Dielytra spectabilis*), and afterwards become unsightly, should be planted behind later-growing subjects, such as Michaelmas Daisies, Galegas, &c., which soon hide the fading leaves with their vigorous shoots.

Arrangement of Colour and Choice of Plants.—It is not an easy matter to keep a mixed border well furnished throughout the flowery months of the year, and to avoid unsightly gaps, but there are always ways of doing it, and even beginners should not be afraid of facing this fact, and of thinking out ways or contriving methods so as to have as few empty places as may be. There are some common-sense

considerations that will be a guide to the choice of plants to use. The first and most obvious is that the plant must be in itself handsome and somewhat showy. The next and one of the most important, is that it should remain a good while in flower. Plants that are in flower a few days only and then are done are of little use in the mixed border, unless their foliage is unusually handsome and persistent, in which case this is so valuable a quality that it may redeem the plant.

The choice of kinds being decided on, the way in which they are arranged then becomes the matter of chief importance. It seems a natural arrangement to use the creeping and short-growing plants in front, and the next in stature behind them, and the tall ones at the back. This is obviously a good general rule, but if not varied with judicious exceptions the result will be very monotonous. Now and then some of the tall backward groups should break forward. Think of the way in which the lateral spurs of a mountain chain descends into the valley or plain. They all do come down to the level, but in how varied and beautiful a way. Think of this and then think of the dull and ugly slope of a slate roof, and then think of your border and apply the lesson.

Then try and get hold of some definite scheme of colouring in order to get richness and brilliancy with dignity. It saves much trouble and puzzling at planting-time to have a regular scheme of simple progression of colour from end to end, so that if you have a yellow-flowered thing to plant you put it in the yellow place and so on. In no way can you get so much real power of colour, by which is meant strength, richness, and brilliancy, as by beginning very quietly at the ends of the borders with cool bluish foliage and flowers of tender colouring, white, pale blue, and palest sulphur yellow, and even with these palest pink, beginning quite *piano*, then feeling the way to full, and from that to stronger yellows; then by a gradual *crescendo* to rich orange, and from that to the *forte* and *fortissimo* of scarlets and strong blood-crimsons, and then again descending in the scale of strength to the pale and tender colouring.

In other parts of the garden you may have incidents of brilliant contrast, which are especially desirable in the case of strong blue flowers, but in the mixed border the way of having the rich and brilliant harmony approached by more delicate colouring can scarcely be improved upon, and so only can the vice of garish vulgarity be avoided.

Plants of the same colouring are intergrouped so that the red group, whether early or late, is always a red group, and

A MIXED BORDER AT KEW.

so on throughout. There are ways of filling gaps by training plants down to fill the spaces. For this use Everlasting Peas, tall perennial Sunflowers, and Rudbeckias and Dahlias are especially accommodating.

Nothing is so destructive of good effect in the mixed border as the old unthinking mixed up way. Plants of the same kind, instead of being dotted at equal intervals, should be grouped together, each group dying away into one neighbouring group, or if there is only one plant of a kind there is no harm in its being one alone if only it is in its right place.

Of course there are other ways of arranging the details of a mixed border, and many devices that may be used to enhance its effect at the different seasons, but these suggestions will be a good basis of operation to any one who is without experience and desires general instruction.

HARDY FLOWERS FROM SEED

FEW pastimes are more interesting than that of raising plants from seed. When a plant is purchased, and the colour of its flower is known, we are exactly acquainted with what to expect, but in raising from seed this is not always so. There is joy in anticipation. Amongst the seedlings may occur a jewel brighter than anything already in gardens. Such prizes occur more amongst some races than others ; Carnations, as an example, occasionally giving a prize amidst, of course, many blanks. Even when the flower raised is not likely to startle the world, there is satisfaction in knowing that this good garden plant was "one of my own raising" ; it has an especial merit in the raiser's eyes, and prompts him to further endeavours.

In offering a few simple remarks on raising of seedlings, a few groups of the more popular kinds may well serve as general examples. It must be clearly understood that the chances of a seed growing after it is placed in the soil depend upon its vitality. That is to say, a life-long experience in gardening or the raising of seedlings avails nothing if the seed is devoid of the germinating power—viz., the power to reproduce itself.

Some of the most popular plants raised from seeds are Carnations, Auriculas, Polyanthuses, Primroses, Anemones, Ranunculus, and so forth.

Soil is undoubtedly the most important consideration. Where possible there will be a desire to go to the nearest florist to obtain soil of the right sort, but in many cases this is impossible, and the common soil of the garden must be used. Take some of this, pass it through the ordinary cinder sifter, mix with it some finely sifted ashes when no sand is available, and put it for a week in a large box, or other dry and convenient place. If the soil be moist and sticky, it must be fairly dry before it is fit for use, and this is accomplished by spreading it out thinly to allow the moisture to evaporate, or by adding some dust dry coal ashes. The orthodox compost for sowing fine seeds should consist of loam, leaf-mould, and sand, the last two being intended to enrich the soil, and render it more or less pervious to moisture. Such a mixture is not

DOUBLE WHITE OPIUM POPPY IN ROUGH GROUND.

always obtainable, though many seedsmen now sell potting soil in sacks for every purpose. Having got the soil into a proper condition of dryness, the next point will be to prepare the boxes or pots for

Sowing the Seeds.—Boxes of a suitable size are easily obtained, those of the chocolate and sweetmeat class being especially suitable. The best class of box is one five or six inches deep, *not more*, and about eight inches or so long. In the bottom make a few holes the size of a halfpenny, or cut out a narrow strip at each side to allow the water to escape. This done, place some rough material, such as small broken coke or cinders, in the bottom to fully an inch deep, and place two inches of soil on this. Gently press it down to make it moderately firm and quite level at the same time. Scatter a little sand over the soil before setting the seeds. All is quite ready for sowing the seeds, which should be turned out of the packet on to a sheet of ordinary notepaper, or any sheet of paper that can be folded in half. The seeds run into this fold in the paper, and one may regulate the sowing—an important point. If sown from the seedsman's packet, it is just possible that fifty seeds will drop down in one place, and none in another, and the result will be a fight for existence when the seedlings appear above the soil. Carnation seed is large, and may even be regulated with the fingers if it falls too thickly, but many other seeds cannot be treated in this way. Take time and care in scattering the seeds quite evenly and thinly over the surface, and finally with a little fine and quite sandy soil cover them not more than a quarter of an inch deep. Seeds of Polyanthus, Primroses, and Auriculas do not want quite so much soil to cover them, and a little soil dredged over them, so to speak, will suffice. The covering soil should be carefully sprinkled on so as not to disturb the seeds, and when all is completed will remain between the soil and the top of the box. By placing a sheet of glass over the box the safety of the seed is insured. Give water only through a small fine rose watering-can. Almost all the smaller seeds may be raised in boxes, and in a sunny window where no frame is at hand, but a frame is better. One gentle watering from a fine rose can will suffice for some days after sowing, and if the glass sheet be covered with a piece of sack or old carpet, the growth of seedlings will be promoted. When the seedlings appear through the soil tilt the glass sheet about a quarter of an inch on the one side to admit air, and discontinue the covering. The larger seeds, as Hollyhocks, Lupins, and Sweet Peas, may all be sown in the open garden.

Raising seeds of hardy flowers is one of the most interesting of all operations in a small garden. Even a cold frame will suffice for them, simply putting on a "light" when the seed is sown, watching for slugs and woodlice when the seedlings show themselves, and when sufficiently large transferring to a prepared piece of ground in the open. We have known delightful groups of Primroses, Polyanthuses, and Auriculas raised in this way. The beginner in gardening who is keen upon raising new flowers with the simple contrivances at his disposal should choose the three charming flowers named, and many beautiful strains, as the florists call a race of unnamed seedlings, may result. There must be system in the work. In the first place purchase the finest seed in the market. Think nothing of the price. The most expensive seed brings the greatest treasures in the shape of finer flowers for colour and form, and also plants of good habit of growth. When there are no prizes the flowers, with few exceptions, are sufficiently distinct and true in colour to use freely in the beds and borders. When seed raising is seriously undertaken with a view to improving an existing race, the seedlings, when large enough to remove, must be planted in a bed by themselves, the individual tufts being far enough apart to develop. The object of this is to remove poor kinds so as to preserve the beauty of the whole race. A muddled, speckled Primrose in the midst of others of clear telling colours has no right there, its presence will probably, through the agency of birds, bees, or insects, spoil the others by its pollen mixing with that of the other flowers. With a bed of seedlings in front of one, destroy all tints which fail to please, and remember that it is important to know that the attributes of a good garden Primrose, bunch-flowered or otherwise, Polyanthus, or Auricula, is a pure self-coloured flower of good shape, held on a strong stem, and free in every way both in bloom and growth. In this way the glorious Munstead Primroses were created by Miss Jekyll, and rich orange, pure white, yellow, and other shades secured, and not only so, but in large heads supported upon strong stems, to produce an effect of colour when massed in the garden.

The Auricula may be treated in quite the same way. We know few flowers so charming in the spring for its wonderful variety of rich colours, its freedom, and perfume. A whiff of Auricula perfume on a spring day fills one with gladness that the winter has gone and brighter and sunnier days ushered in. Raising Auriculas from seed is quite simple, and the same care and attention in selecting the good colours must be

practised as with the Primroses and Polyanthuses. The garden and border kinds, to distinguish them from the edged Auriculas, require severe sifting out; the race is disfigured by weak washed-out yellows, dull purple magentas, and nondescript colours, which have no effect in masses or as edgings to the border, yet with things so easily raised it is not a work of years to achieve important and lasting results. Once a race has been brought as near to perfection as mankind can achieve, it must be maintained thus by ever watching for poor forms likely to contaminate the others.

The history of the Shirley Poppies is a history of great perseverance, and though such keen care is unnecessary with things of the nature of the Primrose and Auricula, the same love must dominate the raiser.

INCREASING HARDY GARDEN PLANTS BY CUTTINGS

To the practical gardener and nurseryman whose business it is to increase and multiply all classes of flowering plants, the one general term "propagating" is that by which the work is most usually understood. Propagation means taking a young shoot or branch from a large parent plant and removing certain leaves at the lowest part to endeavour by a course of careful treatment to give that cutting an independent existence. For present purposes it will be best perhaps to take one or two examples, and by following those on simple lines to make their "propagation" intelligible.

The closely allied families of Carnations and Pinks are well-known groups of hardy flowers, and represent two distinct phases in the propagation of these much-prized hardy flowers.

Firstly then the Carnation :—

The amateur gardener will notice when his Carnations and Picotees are flowering in the month of July that some growths are developing at the base of the flower stem. These growths are called "grass," and are intended when fully grown to be "layered," and thus make fresh flowering plants for the ensuing year. These pieces of "grass" are known as "layers" in all border Carnations and Picotees because of the "layering" method by means of which the stock of these is usually perpetuated. About a single flower stem of Carnation there may be six or more pieces of grass or layers, and the whole of these, if properly dealt with, will make fine flowering plants for the following year. The work of layering is usually accomplished in the end of July or early in August. Perform it in this way. Take one of the layers in the left hand, and beginning from the ground level carefully, remove all the leaves on the stem for a space of two inches. Endeavour in removing the leaves not to tear the skin of the stem, or if preferred remove the leaves with sharp scissors. The object in removing the leaves, which occur in pairs on the stem, is to allow of the growth being well laid down (hence the term "layering") in the soil. Every shoot or layer must be

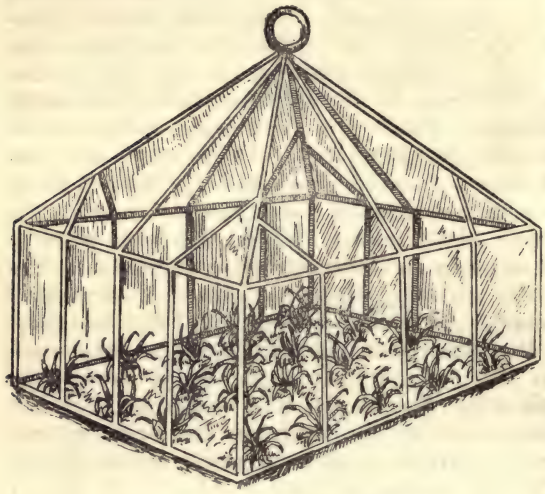
dealt with in the same way until all are ready for putting down. When all the pieces are thus trimmed, gently stir up the soil an inch deep or thereabouts all round the plant.

Purchase some "layering pegs" made of straight bits of thin wire six inches long with a crook at one end, or, what will do just as well, some long hairpins. These are intended to hold the layer steadily in the soil. Then with a sharp penknife make an upward cut in the portion of the stem from which the leaves were removed previously, and this is the method to follow. Take one of the layers with the left hand, grasping all the leaves. Place the forefinger of the same hand low down on the prepared part of the stem, and cut into the stem just below a good joint, continuing the cut in an upward direction for almost an inch. Endeavour to make the cut quite in the centre of the stem. When the knife is withdrawn one portion remains in direct communication with the upper portion of the growth, while the other is separated from it. The separated part is called the "nib" or "tongue," and it is from this that the roots will eventually be produced. Place the layer in the soil, already loosened to receive it. Make a tiny trench with the finger, and while keeping the tongue of the shoot open lay the stem on the surface, and carefully peg it into position, finally covering rather firmly with soil. In every case rooting of the layers is greatly assisted by using a good addition of sand of any kind, even builder's sand will do. This is the practical work of layering, and the same system is followed not only with trees but hosts of rare and beautiful subjects that take a long time to root when other methods are adopted. In dealing with the Carnation thus the chief fear is in the process of making the cut, as frequently the blade slips right through the stem and the shoot is sacrificed. The best way to obviate this is to practise a little on boughs of Privet or shoots of trees before starting upon the Carnation. Give a good soaking of water when layering is finished.

CARNATION LAYERED

The Pink is usually increased from cuttings, and these are called "pipings" by the gardener, but they are simply miniature layers, but by reason of a more wiry nature, root far

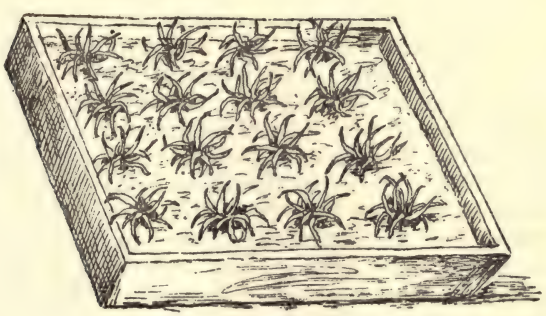
more readily from "cuttings" proper than the Carnation. To increase by "pipings" is quite simple, and may be accomplished as follows:—Take a young shoot, towards the end of June, and cut it off from the parent just below a joint, *i.e.* that portion of the stem where a pair of leaves clasps the stem. At this point there is what appears a slight enlargement of the part, and this is known as the "joint." By cutting a shoot four inches long at such a point, and removing the two lower leaves, a "cutting" is at hand ready prepared for insertion. The true "piping" is only slightly different from this, and to secure it intact take hold of the shoot with the left hand, holding the same with the first finger and thumb, and then by a sharp upward pull, snatch the point of the shoot with the necessary base joint attached. In doing this take care not to select soft shoots—but they should not be in this condition at the end of June—and avoid bruising. The gardener can take these "pipings" very quickly, and as they are ready for insertion without further trouble the operation is very simple. A frame or hand-light is all that is needed to complete the operation. A rather shady place is best, so place the frame there. When one is without even a frame, secure a box a foot deep, make a few holes in the bottom, then place some rough cinders in it to carry away excessive moisture. On the cinders put four inches of sandy soil, making it level and rather firm; then by covering the box with a sheet of glass a perfect propagating box is obtained that will prove of great service either for seeds or cuttings. All cuttings need shade from hot sun, or indeed any sun heat that will make them droop.



PINK PIPINGS UNDER HAND-LIGHT

Multiplying Plants by Root Division.—The best time for this operation is when the plants have flowered, or some

time in advance of it. It is chiefly recommended where only a limited number are required. Pinks, Polyanthuses, Pansies, Auriculas, and many other things may all be increased this way, besides a great array of garden border flowers, such as Phloxes, Columbines, Flag Irises, Christmas Roses, Anemones, and similar things which all lend themselves to free increase by division of the roots. The operation consists in carefully cutting through the root-stock with a pointed knife, or, in other cases, pulling the plants asunder with the hands or fingers. In the latter way Primroses, Pansies, Pinks, Sunflowers, Irises, Polyanthuses, London Pride, white Arabis, purple Aubrietia, and dozens of others may be increased with perfect ease. The best time for the work depends on the time the subject flowers; for instance, the Pink flowers in May and June, and the Pansy about the same time, the Polyanthus earlier. To leave the work of division until the flower-buds appear is to spoil the effect, therefore always be well ahead of the flowering period. It is important that the divided portions should have roots attached, and that these be firmly planted. Place the roots perpendicularly in a well-dug hole, not crammed into a small space, as when thus treated they rot and perish; whereas, distributed properly, and soil placed firmly about them, they quickly take fresh hold, and soon recover from the check. Any plants divided and replanted in spring or dry weather should always be well watered afterwards.



BOX WITH PINK "PIPINGS" OR CUTTINGS

ANNUAL FLOWERS

It is unwise to grow too many plants in the small garden, and especially of annuals, which are often unruly in growth, quickly tumbling over everything near to them, or covering many precious perennials with their trails of stems and leaves. There is wisdom in taking up a few groups and growing them thoroughly—*e.g.* the Poppies, Sweet Peas, and similar kinds, which are both charming in the garden and useful to gather for the house.

Amateurs who delight in colour may have a showy border or flower bed at trifling cost and with little delay. There are, broadly, only two classes of annuals, those known as "hardy" and "half-hardy." The former may be sown in the open border straight from the purchased seed packets, whilst the others require sowing in some warmth, such as a frame or similar contrivance.

Hardy Annuals. — We will consider those for the open ground first—that is, the perfectly hardy kinds, or rather those that by their free growth in common border soil in spring have been so named. Some kinds may be freely transplanted on any showery day, or, indeed, any day by after attention to moisture at the roots, but others do not transplant well at all, unless from small pots with the root-fibres quite intact. The reason of it all is in the way the roots are constituted. Some plants, for example, form a solitary root that goes straight down, and is known as a "tap" root, which produces very few fibres, so that transplanting is always a matter of difficulty. This is the class the seed of which must be sown where it is to flower. Only by treating the plants in this way is it possible to obtain the best results. These explanatory remarks will, we hope, save the amateur from travelling along the wrong line. We must assume that the beginning of the year is at hand, and preparations being made for a display of flowers in the summer.

The soil requires first consideration. Well-dig the beds or borders at once, putting in rather deeply plenty of well-decayed manure. If the garden soil is heavy, inclining to close clay, get a load of road sweepings or grit, and either dig this in with the manure or spread on the surface when digging is completed. Do not be afraid to dig deeply even when a

SWEET SCENTED TOBACCO (NICOTIANA SYLVESTRIS) ON A LAWN.

little bad-coloured soil comes to the top, for this can always be treated and made better on the surface. Leave the surface quite rough, so that frost and air may play their part in the pulverising and refreshing of the soil. These are the reasons for undertaking this work in winter, and the soil below is in its turn being gradually enriched for the roots. If slugs abound give a good dressing of soot, and six weeks after a small dressing of lime may be of service. In March fork over the ground, break up all rough clods of soil that have not fallen to pieces by the action of the frost, and break down the surface rather finely for the reception of the seeds. Use the large four-tined fork for this work, breaking down, making fine, and raking all in one. Whilst performing this work avoid treading the soil as much as possible, particularly when of a heavy clay. On the other hand, very fine and sandy soils, or those of light character, may be much benefited by making them firm, which is achieved by treading or by beating with the back of the fork. Very light and warm shallow soils, much drained by sand or gravel beds below, should receive a heavy dressing of cow manure in preference to all others. This is especially recommended owing to its lasting and cooling qualities, cow manure in these cases being especially valuable.

Sowing the Seeds.—This is an important matter, and must be largely left to the amateur, who may perchance require lines, or circles, or diamonds, or many other designs to suit his own desires. But however the seeds are sown, one point must be emphasised, and that is the evil of overcrowding of the young seedling plants. If any doubt exists concerning the germinating powers of the seeds, sow them more thickly ; when, however, the seedlings appear at the rate of 90 per cent. when only 40 per cent. was anticipated, on no account leave the lot. To give a practical illustration of the results of overcrowding place a single seed of a Mignonette in the ground and the seedling will spread into a mass a foot or fifteen inches across covered with fine spikes, but allow thirty seeds in the same space and the outcome is a crowd of plants that remind one of mustard and cress struggling for existence. Many seeds, and of annuals in particular, may be sown thickly, but when the seedlings appear above ground lose no time in thinning them out to a reasonable number for any given space. Even then one may rest assured that, in the majority of instances, the error will be in leaving too many plants for flowering. Sow early, thinly, and begin to thin the seedlings when in the first rough leaf. By daily watching note how quickly or otherwise those remaining occupy the vacancies, and, if quickly, promptly thin again.

Such seeds as Virginian Stock, Candytuft, Mignonette, and others are often sown in heaps, thus leaving no room whatever for future development, and poor, stunted, or diminutive growth is the result. Suppose, for instance, one wishes to make a fine display in a mixed border, and groups about three feet across are desired. For these the Candytufts or Mignonette would be suitable, and if good seed has been procured fifty seeds will be ample to sow over this space. Many amateurs would sow a threepenny or a sixpenny packet on the same space, but if good masses of bloom are required the fifty seedlings should be reduced to quite one-half the number. This little instance will show the importance of plenty of space for the plants' development, and what is true of those mentioned here as examples is equally true, even if in a modified way, of everything else that may be classed as Hardy Annuals.

A word of warning after thinning may be necessary. Many young plants are loosened by pulling out those by their side. Take care, therefore, that those remaining be made quite firm in their places. It is wise to maintain a succession of the best kinds. This may be accomplished in a large degree by successive sowings at intervals, and generally it is the best method to adopt. Others, too, may be sown in pots, a plan best followed where the ground has been or is likely to be occupied far into the year. In gardens where the so-called spring bedding is adopted, the pot system of raising hardy and half-hardy annuals is a good one for filling up the gaps. The same method may also be adopted for very early work. For example, the Sweet Sultans and Sweet Peas are great favourites always, and very welcome when flowered quite early or before those in the open ground have expanded. Stocks and Asters, too, are quite amenable to this treatment, the former more especially because they transplant badly.

In sowing all the seeds of annuals the smallest covering of soil is usually sufficient as a general rule ; but the seeds of the various plants vary so much in size that it is better to cover small ones only half an inch deep or even less, and the larger-seeded kinds somewhat deeper. A method often practised is to draw a line or a circular drill with a stick, or with the first finger, and sprinkle in the seeds, finally scratching the soil over again with a small hand-fork. Other seeds required in larger groups may be sown thinly broadcast and raked in with the teeth of a small hand-fork.

Gathering of the Flowers.—A plant of the nature of an annual cannot bear a double burden, the strain is too much,

and once seeds are permitted to form the flowers cease to appear. This is, of course, quite natural. An annual is generally frail—at least its quick growth does not signify that it is able to support seed and blossom at once. The truth is gardening is not a lazy pastime, but demands constant watchfulness and attention to small details. Keep the poppy pods picked off immediately the last petals have fluttered to the ground, and treat everything in the same way, Sweet Peas especially, for no annual "gives out," as the gardener says, more quickly than this fragrant annual when the seed pods are permitted to remain. When these necessary details are attended to, flowers are produced until frost puts an end to all things of this nature.

To sum up, annual flowers must have greater attention than is usually given to them; the soil must be enriched and properly prepared, making heavy ground fine, and working in half-rotted stable manure, wood ashes, or rough sand, anything of this character to lighten it. An open and porous soil is necessary. Sow thinly, and not too deeply. When the seed is very small, a very light covering, amounting almost to sprinkling, will suffice. Keep the seedlings free from weeds and the mature plants from ripening seeds.

Half-Hardy Annuals.—The words "half-hardy" are used to denote those kinds of tender growth; and seeds must either be sown quite early in the year, under glass, or late in the spring when frosts are neither severe nor frequent. The China Aster is typical of a half-hardy annual, and there are many families as showy and as useful in the summer garden. The amateur gardener will probably choose a simple hot-bed for sowing the seeds upon, and with this warmth many things may be raised with a small amount of trouble and expense. Select for the seed a quite shallow pan or pot, and always sow thinly, and usually not before late February, and through March and April. It is useless to sow very early in the year; the plants appear in the dark days, make little progress, and become miserably drawn out and weedy. Only by a steady growth to insure vigour and "solidity," so to speak, is it possible to obtain a wealth of flowers true in colour and in form. A mixture of loam, well-decayed manure, leaf-mould, and sharp silver sand will suffice for soil; and in watering immerse the receptacle to the rim, so as to allow the water to soak up through the hole in the bottom. When the surface of the soil is watered, the seed is frequently washed to one side of the receptacle. A hot temperature is unnecessary, and the thermometer should never go beyond 65 degrees. Of course, the object of

this is to get strong growth, impossible in the stewing heat of a hot-house.

It is impossible in some gardens to afford artificial heat, and in such cases sowing must be deferred until May outdoors. This is not the proper course where means are available for sowing under glass.

SWEET PEAS

This annual flower is too beautiful and fragrant to simply enumerate in a general list without further reference to its importance in all gardens, whether of the palace or of the cottage. In the days of old, the mixed packets of seed afforded a great variety of colours, pink, purple, rose, and others, but at the present time we have the beautiful kinds raised by Mr. Eckford and others, which may be obtained in mixtures or in separate packets—that is, in distinct kinds.

WAYS OF GROWING THE FLOWERS

Autumn Sowing. — Several annuals are better for this practice. They gain great strength during their slow progress in the winter months, and the vigour of the plant when it has made its full growth in late spring or early summer is only equalled by the size and quality of the flowers. But in no annual garden plant is the gain of autumn sowing so conspicuous as in the Sweet Pea. Instead of having to wait until July for the flowers, the earliest autumn-sown plants are in full bloom in the earliest days of June, and the flowers are so much larger and longer stalked than on those sown in spring, and more welcome as the only thing of the climbing Pea kind then in bloom. Perhaps the seedlings would not be sure to stand the winter in the colder parts of our islands, and even south of the Thames a very cold winter may now and then destroy them; but the advantage of securing this fine early flower display in most years is well worth the risk of occasional loss. The best way is to sow the seeds in a shallow trench in a double zigzag line, giving each plenty of space, not less than three inches from pea to pea. The seedlings will be about four inches high to stand the winter. If unusually cold weather comes, a protection of Spruce boughs or anything suitable can be used. When they are making strong growth in spring slightly earth them up, and a little not over strong manure water is beneficial.

Spring Sowing is the usual practice. Those who are

SWEET PEA FLOWERS IN VASE.

happy in possessing large gardens can sow them freely, even to the extent of devoting a border to them; but in the small garden this is not so, and the Sweet Peas must be put where there is sufficient space. By the margin of the vegetable plot or the fruit trees will prove suitable, anywhere their flowers are near together, and perfume the garden. Where extra trouble is of little moment, a good way is to sow a few seeds in five-inch pots in April. Place them in the greenhouse to promote quick germination, and then to a cold frame to harden the growth. At the end of May plant out with as little disturbance as possible to the roots. By growing them under glass it must not be thought that anything in the way of forcing is desirable. A very warm temperature means a drawn-up, weakly growth, which will never give strong, well-coloured flowers. Place the seedlings quite near to the glass to prevent a possible attenuated stem. With spring sowing out of doors, the usual way is followed: sow in April, and mix some well-decayed manure with the subsoil. Keep a watchful eye for slugs, and during the early stages protect with twigs or ferns. Remember the advice given, that to maintain a succession of flowers keep the seed pods picked off; and we must look over the plants two or three times a week for this purpose.

Selection.—Sweet Peas are very numerous, and not a few so much alike that it is needful to make a careful selection. Blanche Burpee and Sadie Burpee are the purest of the white flowers unquestionably. Countess of Radnor is a soft mauve-lavender, a very pretty shade; and Lady Grisel Hamilton may be best described as heliotrope. Creole, a deep purplish colour, is very handsome; and other good kinds are Mrs. Eckford, Mr. Gladstone, or Apple Blossom, soft rose-pink; Prince Edward of York, rose and scarlet mixed; Gorgeous, orange and pink; Lady Nina Balfour, mauve; Lady Penzance, rose, touched with salmon; Etna, crimson; Salopian, orange-red; Primrose, primrose shade; Mars, crimson.

SUMMER BEDDING

THERE are many to whom masses of bright colour in the flower garden still appeal, despite the great popularity now enjoyed by hardy plants, and to none perhaps are they more welcome than to the owners of small gardens, who, not having sufficient space for a good herbaceous border, are glad to avail themselves of "bedders" to produce a bright, attractive display of flowers and foliage.

Summer bedding, *i.e.* the employment of certain plants for filling beds in the flower garden during the summer months, may be conveniently divided into two classes. (1.) Where an effect is obtained by the association of several kinds of plants, and (2.) where the aim is to produce a mass of colour by means of filling a bed with but two or three different subjects. The former arrangement usually called "Mixed Bedding," we will first consider.

MIXED BEDDING

Many charming results can be obtained by this practice if the plants are carefully selected and judiciously arranged.

The size of the garden will, of course, determine the nature and composition of the beds. If the former is small, then obviously it would be unwise to have large beds. Their effect and beauty would be lost, and the smallness of the garden accentuated. We must therefore be content with small beds and dwarf plants, leaving the introduction of tall and vigorous growing subjects to those having more extensive domains. This does not, however, imply that good effects cannot be obtained by means of small beds; on the contrary delightful arrangements can be made in the latter. We will now mention a few of the most suitable plants for mixed bedding, and afterwards give examples of their use.

FOR SMALL BEDS

Abutilons in variety, including the beautiful variegated ones, *A. Thompsoni* and *A. Souvenir de Bonn.* The Abutilons make most charming subjects for small beds, their flowers ranging through a great variety of colours.

AN OLD GARDEN IN IRELAND.

The above mentioned are particularly effective. The following are good varieties :—Canary Bird, Golden Fleece (yellow), Boule de Neige (white), Sanglant (red), King of Roses (pink). Abutilons are best propagated by taking cuttings in the spring, inserting several in a six-inch pot, filled with sandy soil, and placed in a warm house near the glass. When rooted, gradually inure them to a cooler temperature.

Acacia (*Albizzia lophantha*).—This plant has beautiful, deeply-divided leaves, and specimens two feet or so high, add considerably to the attractiveness of a bed of small plants. Sow seeds early in the year in a warm temperature, and gradually harden off the plants. *Alonsoa Warscewiczii* and *A. incisifolia* are dwarf plants, twelve inches or so high, bearing small orange-red flowers. Sow seeds, or take cuttings early in the year, and treat as above advised for Abutilons.

Solanums.—These have an effective and uncommon appearance, and are eminently suited for mixed beds. *S. Warscewiczii* (small white flowers, spiny stems), *S. pyracanthum* (having lovely deep yellow spines wherein lies its chief beauty), *S. Balbisii* (flowers light blue), and *S. ciliatum*, var. *macrocarpum* (with striking, rather large, red fruits), are some of the best for mixed summer bedding. Raised from seed sown in early spring.

Begonias.—Amongst the most useful of these for the purpose in question are *B. castanæfolia* (with pink drooping flowers), *B. worthiana* (large orange-scarlet drooping flowers), *B. knowsleyana* (white flowers). Propagated by the insertion of cuttings in spring.

Other plants suitable are *Agathæa cælestis* (dwarf, blue daisy-like flowers), *Sanvitalia procumbens* (dwarf, small yellow flowers), *Cuphea ignea*, and *C. platycentra* (dwarf, with small tube-shaped red and yellow flowers), *Lobelia cardinalis* and *L. fulgens* (scarlet flowers, growing two feet high or more).

EXAMPLES

DWARF-GROWING PLANTS FOR SMALL BEDS

1. Ground work of *Cineraria maritima* (dwarf, with handsome silvery leaves). *Begonia worthiana* planted irregularly about eighteen inches to twenty-four inches apart. Yellow Celosias dotted here and there.

2. Cover the surface of the bed with *Mesembryanthemum cordifolium variegatum*, and plant at intervals *Begonia Lafayette* (bright red), and *Solanum pyracanthum* alternately.

3. Use *Agathæa cælestis* as a groundwork, and above have *Abutilon Thompsoni* and a few plants of *Acacia lophantha.*

4. Undergrowth of Pelargonium Surprise (salmon-coloured flowers), with small plants of the variegated Maple placed at irregular intervals of 2½ feet. In between these latter, plant *Verbena venosa* (violet-coloured flowers), and make an edging with *Abutilon vexillarium variegatum.*

LARGE BEDS

Plumbago capensis (lovely pale blue flowers, shrubby climber; cuttings); *Streptosolen Jamesoni* (brilliant orange red flowers; cuttings), Cannas in variety (propagated from seed, or by division of the roots), *Campanulas pyramidalis*, and its white variety *C. p. alba* (raised from seed). This plant is a biennial, flowers the year after the seed is sown; sow in July. *Ricinus communis* (handsome foliage; seed), *Nicotiana sylvestris* and *N. affinis* (both bearing beautiful white flowers; seed). The Plantain Lilies (Funkias; handsome foliage and flowers; division). All the above are of great value in the composition of large flower-beds. It must, however, be understood that good-sized plants are necessary to make a satisfactory display; in most cases the plants must therefore be a year or more old.

By the use of such as the following a sub-tropical appearance is given to the garden, and these plants are termed sub-tropical:—Yuccas, Dracænas, Funkias, Ficus, Aralias, *Chamærops excelsa* (a hardy palm), *Ailantus glandulosa* (the Tree of Heaven), *Arundo Donax* (the New Zealand Flax), *Gynerium argenteum* (Pampas Grass), *Acanthus spinosissimus*, *A. mollis*, and *A. lusitanicus.*

EXAMPLES OF LARGE BEDS WITH BOLD MIXED PLANTING

1. A group of *Dracæna indivisa* in the centre, surrounded by *Araucaria excelsa* and *Ficus elastica;* then a display of variously-coloured Cannas, *Asclepia curassavica* (with showy orange-coloured flowers), *Hydrangea paniculata grandiflora* (white), these plants being placed in small groups by themselves; nearer to the edge of the bed put red and yellow Celosias, and finish with a margin of dwarf Begonias and *Chlorophytum elatum variegatum.*

2. Cannas in the centre, with *Campanula pyramidalis* and *C. p. alba* and *Nicotiana affinis* planted between; edged with variegated Pelargonium.

3. Bed of *Nicotiana sylvestris*, having Cannas and Chimney Campanulas (*C. pyramidalis*) between.

4. *Plumbago capensis* and *Streptosolen Jamesoni* planted alternately. The white Chimney Campanula and bronze foliage Cannas between.

PLANTS FOR MASSING

Fine colour effects, that add considerably to the brightness of a garden, may be obtained by massing such things as the following: Verbenas (Ellen Willmott, of a lovely salmon pink, is the best), *Cineraria maritima*, various Zonal Pelargoniums, *Calceolaria amplexicaulis*, *Begonia worthiana*, *B. semperflorens*, and varieties (these are splendid for massing); tuberous Begonias, *Fuchsia gracilis*, *F. regalia*, *Salvia patens*, and *S. splendens*, and varieties. Coleus in variety, Pentstemons, Tropæolums, &c.

For providing edgings and for covering the surfaces of flower-beds, *Mesembryanthemum cordifolium variegatum*, Altenanthera (various), *Lysimachia nummularia aurea* (Golden Moneywort or Creeping Jenny), Echeverias, *Carex glauca*, blue Lobelia, Golden Feather, &c., are indispensable.

THE CARNATION AND PICOTEE

The Carnation is certainly one of the most beautiful flowers of the garden. For three centuries at least it has been pre-eminent in English gardens, and is cultivated by all classes. The cottagers grow it in their small front gardens; the occupants of villas, now so numerous near every large town, make a speciality of the Carnation, for it will thrive and produce its handsome flowers where the Rose has to struggle for existence. A gentleman of some eminence in London, and who lives within three or four miles of the Bank of England, had made up his mind to leave his residence and go farther into the country, as he could not grow Roses and other flowers he loved. He tried Carnations, which were a great success, and he then decided to remain in the old home. There is no sense in making comparisons favourable or unfavourable between Carnations and other flowers of the garden; all flowers have their admirers. They do not all flower at the same time, but some can be obtained at all seasons by skilful culture, others cannot. Amongst those amenable to forcing and flowering at every season of the year is the Carnation.

It will be my duty to give as full an account as possible of

the Carnation and Picotee in every class, those beloved of the "florist" as well as the even more popular garden varieties.

The Carnation in its wild state is the *Dianthus caryophyllus* of the botanist, and is found generally on the walls of old castles, &c. It did grow at one time, and may now, on the walls of Rochester Castle. This may give us some inkling of the conditions under which the plant may be cultivated in our gardens. Certainly the supply of food to be obtained on the walls of an old castle cannot be rich; but it is well known that such plants are free from the diseases that afflict the tufts nursed on rich loam, and stimulated with artificial manures.

Border Carnations.—This is somewhat a vague term, as almost every class or section of the Carnation is adapted for culture in the garden, and it is merely a matter of the taste of the owner of the garden as to the varieties that are preferred. A very fine display can be obtained by growing seedlings, but to obtain anything like good results seed should be saved from the finest varieties in cultivation, and the flowers ought also to be cross-fertilised. This is done by setting aside the best varieties in their respective classes, and using the pollen of a variety with well-formed flowers and of decided colour.

The seed bearer should be of robust habit and of good constitution; the flowers to be also of high-class quality. The flowers of Tree Carnations are cross-fertilised in May and June. So also is the Malmaison for seed. This is never for sale. The border and show Carnation seed is obtained by placing the plants under glass, and setting the blossoms in July, as in that month the flowers are produced without forcing. The seed will ripen in two months, and the pods must be gathered as soon as the seed is nearly black. The pods become brownish when the seed is ripe. Dry the seed in the pods, and when it has lain in a dry place in the pod for two or three weeks the seed may be removed, done up in packets, labelled, and dated, and kept until the spring. The Tree Carnation seed should be sown in February, and if the plants are grown on and carefully attended to they will flower in the autumn and winter of the same year. On the other hand, the Malmaison and border Carnation seed is best if sown about the end of March or early in April, so that the plants have a full season to make their growth; they will flower in due course the following season. The flowering of the seedlings is a time of excitement; there will be some pleasant surprises, and, until the amateur is seasoned by some years of experience, times also of disappointment. I receive

hundreds of letters from amateurs in the course of the season, and it is amusing to read the different notions they have of the results to be obtained from sowing seed. Many have an idea that they can reproduce the finest varieties from seed; others that if the seed is saved from the best varieties all the seedlings may be like their parentage to a certain extent, and if any varieties are produced amongst them with single flowers, showing a reversion to the original parentage, the easiest way is to blame the seed. Taking a hundred plants raised from the best strains of seed, there would be a dozen to fifteen plants with single flowers. Seventy or eighty would be varieties with double flowers of unequal merit; perhaps five or six might be worth growing again to be tested against the named varieties.

The cross-fertilisation gives some very curious results. For instance, it is intended to produce some new varieties of yellow or white ground Picotees, and care is taken to cross-fertilise the best varieties in the various classes. The flowers may be yellow or white, with narrow margins of red, rose-pink, purple, scarlet, &c. The seedlings produced from such crosses would give a large proportion of self flowers, and nondescript fancies of various colours. The yellow ground varieties produce many seedlings with white grounds; but seedlings from white ground Picotees may never be expected to produce varieties with yellow grounds. Similar results are obtained if seed is saved from flaked and bizarre Carnations; selfs and fancies are freely produced from such, whereas an inexperienced amateur might think he ought to have all white ground Picotees from seed saved from such, and the same with flakes and bizarres.

When choice varieties are obtained they should be propagated from layers in the usual way, and a good stock of healthy plants will soon be established.

A bed of well-grown seedling Carnations is a beautiful feature in any garden. The seed if sown as advised about the end of March, and the plants well cultivated—that is, planted in good deep rich soil and about fifteen inches asunder—each of them will produce a hundred to two hundred blooms, and they may be cut in handfuls of flowers and buds borne on long stems. For placing in vases for this purpose the single flowers are also of merit.

Propagation and Culture of Border Carnations.—Every one with a garden of any kind can grow border Carnations. They do not suffer much, if at all, in an impure atmosphere, but to obtain the best results good loam is needed, with some good rich manure, placed some six inches below the surface.

The fibrous roots very soon reach the manure and the effect is seen in healthy foliage and large well-developed flowers.

The plants are obtained by layering in July and August. The layering may be continued into September, but the strongest and best plants are from layers late in July or early in August. About the last week of September, or any time during the month of October, they may be removed from the parent plants, and planted out where they are to flower. The Carnation gives the best results if planted in beds or masses, so that an imposing group of one colour is obtained if the garden is a large one; small beds may be made of white, crimson, yellow, scarlet, pink, &c. In small gardens there may be room for one small bed only; in that case mixed colours must be grown. The plants ought to be about fifteen inches asunder, as a certain space is necessary for layering. The plants may also be put out in open places in the mixed border; the layers may be thinned out from these clumps, some good soil placed around those that remain, and in this way a greater mass of blossoms may be obtained the following season. In some gardens, and in certain districts unfavourable to the growth of the Carnation out of doors in winter, it may be better to pot up the plants in small flower-pots. The flower-pots are termed small, medium, and large 60's, $2\frac{1}{2}$ inches, 3 inches, and $3\frac{1}{2}$ inches inside measure. Two plants are placed in the large size and single plants in the smaller sizes. They are potted firmly, and a good compost is four parts fibrous loam, one part leaf-mould, and one part decayed manure; this material answers admirably. The plants can be wintered in ordinary garden frames. The lights may be kept rather close for a week or so, but when fresh roots are formed they should be removed whenever the weather is favourable, and during the winter only give sufficient water to keep the potting soil from becoming dust dry. The best time to plant out the Carnations in spring is about the end of March or early in April.

Nearly all amateurs grow a goodly number of plants in flower-pots. When this is the case they are repotted in March, using a similar potting material. Two plants may be put in an eight-inch flower-pot and three in a nine-inch. Drain the pots well with potsherds. Some fibrous material ought to be used to prevent the loose particles of soil from mixing with the drainage. If the weather happens to be favourable at the time of repotting, the plants may be put out at once into the open garden. But if cold east winds are blowing, they do better in frames until they become established. At the same time they seldom suffer from cold, wet is more

likely to be injurious to them. Pot firmly is an established axiom amongst Carnation growers, but this may be overdone. I have seen it so at my own potting-bench. The best border Carnations are the self colours, and they are now to be had in almost any shade.

Amongst white varieties: Trojan, Wild Swan, George Macquay. The Briton and Helmsman are the best.

Yellow: Germania is amongst the best, but it has lost its vigorous constitution; Miss Audrey Campbell, Mrs. Prinsep, The Naiad, Pandelli Ralli.

Buff or apricot of shades: Etarre, Cinnamon, Midas, Mrs. Colby Sharpin, Prince of Orange, and Benbow.

Crimson: The old Clove is still much sought after, Boreas, Mephisto, Nox (the darkest crimson of all), and Uriah Pike.

Scarlet: Quentin Durward, Lady Hindlip, The Cadi, Mrs. M'Rae, and Isinglass.

Dark rose or pink: Asphodel, Enchantress, Pride of the Garden, and Francis Wellesley.

Pale rose or pink: Alma, Blushing Bride, Bomba, Mrs. Gascoigne, and Queen of Scots.

Blush: Dick Donovan, Her Grace, Cassandra, Magna Charta, and Waterwitch.

Red: Bella Donna, Lamplighter, Sir John Falstaff, and Mrs. Sydney Diver.

Heliotrope or mauve colour: Garville Gem, Lady Jane Grey, Haidee, Columbus, and The Druid.

Most of the above varieties have been produced by careful cross-fertilisation in the garden of Martin R. Smith, Esq., as well as the fancy varieties enumerated below. Next to the selfs in importance for cultivation in flower-borders are the—

Fancy Carnations.—These have a ground colour of white, blush, yellow, or buff, striped or mottled with one or two colours, and up to five or six years ago there were few good varieties in cultivation; now they are numerous and in great variety. The best are:—Bertie, pinky white, shaded crimson; Cockatrice, yellow, heavily marked and edged crimson; Dalgetty, white ground, edged and flaked purple; The Baron, buff ground, edged and flaked deep crimson; Aureola, yellowish buff with deep crimson margin; Brodick, yellow, flaked rosy-red; Czarina, heavily edged and marked scarlet; Artemis, scarlet, flaked and streaked lavender; Elf King, deep lavender, flaked scarlet; Hidalgo, rich yellow, heavily marked red and maroon; Mrs. J. A. Reynolds, buff, heavily marked scarlet; Oliver, yellowish buff, heavily edged and spotted crimson; Perseus, yellow ground, edged and flaked orange, red, and lilac; Queen Bess, apricot ground,

marked with flakes of rose-lilac and rosy-red; Sweet Lavender, apricot ground, edged and flaked pale lavender; Yolande, deep yellow, heavily edged and flaked crimson; Henry Mackenzie, yellow, lightly margined and marked rose; Mona, buff ground, scarlet margin; Sir Walter Scott, reddish buff, lightly edged and streaked red; Miss Florence, petals white, lightly dashed rose-red; Miss Mackenzie, buff ground, flaked rose; Pelegia, deep pink, flaked silvery slate; Monarch, buff, marked crimson; the Czar, yellow ground, with heavy margin of purple; Zingara, yellow ground, heavily barred and flaked maroon and red.

The above are the best of the genuine border Carnations, although every class and section of them, except the Tree Carnations and the Malmaisons, may be thus described.

Next in importance as border and greenhouse plants are the—

Yellow Ground Picotees.—Amongst fanciers there are frequent disputes as to what is really a yellow ground Picotee, as in the opinion of those best able to judge, the varieties named and classed as yellow ground Picotees are more allied to fancy Carnations. This is so, and the National Carnation and Picotee Society requested a committee of its members to define the varieties that should be classed as Picotees, separating the others and putting them in the fancy class.

A perfect yellow ground Picotee should have a clear yellow ground, with the margin narrow or wide of one colour, red, rose, crimson, scarlet, and purple, but without spots or markings of any kind on the petals. Very few are to be found up to this standard of excellence. The variety raised by Mr. Martin R. Smith, and named Childe Harold, is the best example, but it is not yet in commerce. The following almost reach this standard:—Carracci, Daniel Defoe, Edna May, Lady St. Oswald, Lauzan, Borderer, Badminton, Countess of Jersey, Day Dream, Dervish, Duke of Alva, Empress Eugenie, Hygeia, Ladas, Lady Bristol, Mr. Nigel, Mrs. Douglas, Mrs. Tremayne, Miss Violet, Mrs. R. Sydenham, Mohican, Ouida, Professor, Stanley Wrightson, and Wanderer. I find most of the above varieties grow as freely in the open garden as they do with me in the greenhouse, when the beds are raised about three inches above the surface of the ground. Indeed, it will be found that all the more delicate forms of Carnations pass through the winter and spring months in much better condition when treated thus.

Next in importance are the—

Bizarres and Flakes.—These are the favourite flowers of the old florists, and are still grown to a high state of per-

SELF AND OTHER COLOURED CARNATIONS IN OPEN BEDS.

fection in cottagers' gardens in the north, especially on Tyneside, where they may be seen in great beauty in very out-of-the-way places in August. They are divided for show and exhibition purposes into six classes, as follows: —I. *Scarlet Bizarres.*—These have a white ground, or as near white as possible; the purer the white is the greater are they esteemed. The colours are divided into lines and flakes, and in this class are maroon and scarlet. The best varieties are: Admiral Curzon, a very old variety, and still not surpassed when at its best; Dr. Hogg, Edward Adams, Joseph Crossland, Robert Houlgrave, and Robert Lord. II. *Crimson Bizarres.*—These are white grounds, flaked and striped with crimson and purple. The best of them are: Bruce Findlay, C. F. Thurston, J. S. Hedderley, Master Fred, Phœbe, and J. W. Bentley. III. *Pink and purple Bizarres.*—These are pink and purple, some a very pale pink are of delicate beauty. The best of them are: Autocrat, Harmony, Princess Beatrice, Mrs. Barlow, Squire Penson, and Sarah Payne. This last is very old, but still grown for its charming arrangement of colours. There are also three sections or groups of flaked Carnations included in the show or florists type. IV. *Purple Flakes.*—These have also a white ground with flakes of purple. The best of them are: Charles Henwood, James Douglas, Squire Whitbourn, Gordon Lewis, and George Melville. V. *Scarlet Flakes.*—Alisemond, Flambeau, Guardsman, Miss Constance Grahame, Robert Cannell, and Sportsman. VI. *Rose Flakes.*—Lady Mary Currie, Mrs. Rowan, Pandora, Rob Roy, Thalia, Tim Bobbin.

White ground Picotees follow after the show Carnations. These have attained to a much higher standard of excellence than the yellow ground Picotees, as the larger proportion of the white grounds have the correct narrow, medium, or broad margin of colour, with the white ground without flake, spot, or bar. These, although termed—

Picotees, are really another type of Carnation with a marginal colour only. The cultural requirements are similar in each case.

For garden and exhibition purposes they also are divided into six classes or sections, viz., Red-edge, light and heavy; Purple-edged, light and heavy; Rose and scarlet-edged, light and heavy. The best varieties are as follows:—I. *Heavy red-edge.*—Brunette, Ganymede, John Smith, Minos, Dr. Epps, and Princess of Wales. II. *Light red-edge.*—Acme, Emily, Grace Darling, Mrs. Bower, Mrs. Gorton, and Thomas William. III. *Heavy purple-edge.*—Calypso, Fanny Tett, Mrs. Chancellor, Polly Brazil, and Zerlina. IV. *Light purple-edge.*

—Amelia, Ann Lord, Her Majesty, Lavinia, Nymph, and Somerhill. V. *Heavy rose and scarlet edge.* — Constance Heron, Edith D'ombrain, Little Phil, Mrs. A. R. Brown, Mrs. Foster, Mrs. Payne, and Mrs. Sharpe. VI. *Light rose and scarlet edge.*—Daisy, Ethel, Fortrose, Liddington's Favourite, Madeline, and Mrs. Rudd.

Malmaison Carnations. — These are well known as amongst the very choicest of greenhouse flowers, and are greatly admired for their sweetness and beauty. The original type of Malmaison is of a blush tint, and from this blush Malmaison there subsequently sported a variety with flowers of a decidedly pink colour. Later, a striped one was produced well marked with lines and flakes of a deep pink on the blush ground. A distinct variety with flowers of a crimson colour, may also be a sport, as it resembles it in form and the foliage is similar.

Another variety, with large crimson flowers, was introduced by Messrs. Kelway of Langport, and stated by them, in answer to my inquiry, to be a seedling variety. It was thought at one time that seedling Malmaisons were practically impossible. Martin R. Smith, Esq,, has set this matter at rest by producing in his garden at Hayes in Kent hundreds of seedling Malmaisons, many of them of the highest standard of excellence. The choicest of them have been selected and placed in commerce, and are now extensively cultivated and highly esteemed.

They are propagated freely both from layers and cuttings or slips. These may be taken off in May and placed under hand-lights or a propagating frame in a little bottom heat. They must be shaded from bright sunshine, and also kept close until roots are formed. When it is seen that some growth is made more air must be admitted, and the shading not so close over them as at first. Layers are the most convenient method of propagation, and it is only desirable to make slips of the growths that are too high up on the main stem to be layered in the flower-pot. When the layers have formed roots, which may be in July and August, they ought to be potted up into sixty-sized flower pots, using similar soil to that required for other Carnations. The plants must be potted into larger flower-pots when necessary. In all stages of growth, especially in winter, the plants should be near the roof glass, and in a dry, airy atmosphere. A close atmosphere, especially in the early spring, is sure to cause "spot." The temperature in winter and early spring ought not to be higher than from 50 degs. to 55 degs. as a minimum, with 5 degs. more in the daytime.

I have made a careful selection, and the following are the best:—Calypso, pale rose; Horace Hutchinson, bright scarlet; Lady Grimston, pinkish white, handsomely marked deep rose; Lord Rosebery, dark rose; Lord Welby, dark crimson; Margot, bright rose; Mrs. de Satge, bright scarlet; Mrs. Everard Hambro, crimson-rose; Mrs. Martin Smith, rose; Nell Gwynne, pure white; Prime Minister, light scarlet; Princess May, bright rose; Sir Evelyn Wood, salmon-pink, darker stripes; The Churchwarden, crimson-scarlet; Trumpeter, very dark scarlet, distinct. The old blush and pink Malmaisons added to the above makes the best selection of eighteen varieties.

Tree or Perpetual-Flowering Carnations.—These are the most delightful ornaments of the greenhouse and conservatory in the late autumn, winter, and spring months, and they are so easily grown that any amateur may enjoy their beauty and delicious fragrance all the year round, for in truth they will continue to flower all through the summer. Large well-branched specimens will give at least a hundred blooms during the season, but perhaps the most useful for ordinary purposes are those grown and flowered in five and six inch flower-pots.

Propagation and General Culture.—As the shoots or slips cannot be layered owing to their position on the plants, they must be propagated entirely by slips or cuttings inserted into pots of sandy soil, and placed in a propagating frame. The earliest cuttings are put in early in January; they form roots in two or three weeks, and should be removed from the frame as soon as they are rooted, pot them off into small flower-pots, and gradually inure them to a cooler atmosphere. They do better out of doors after the month of May, and should be taken into the greenhouse early in September, when the earliest of them will begin to flower. These one-year-old plants are allowed to flower in five and six inch flower-pots, and the same potting materials may be used as for the others. If large plants are wanted, they may be repotted after flowering, into eight and nine inch pots. For these larger plants the soil ought to be packed in firmly over good drainage secured by some quite fibrous loam over the potsherds. In the early stages of growth the plants ought to be stopped. When they are merely about four inches high the centre should be pinched out, and this may be done a second time if the plants are not bushy enough. The plants must be kept clean and quite free from insect pests. An occasional fumigation with tobacco smoke will effect this.

A few of the best and most distinct varieties are:—Comus, white, fine form; Countess of Warwick, rich crimson; Julian, very large, crimson-scarlet; Lizzie M'Gowan, white,

free-flowering; Mlle. Terese Franco, large, delicate pink; Mrs. Moore, very good, pure white; Miss Megan Owen, fringed petals, white, rose centre; Miss Joliffe, a good old variety, delicate pink; President Carnot, the darkest crimson; Primrose Day, large, deep yellow; Princess Alice of Monaco, large, whitish, deep rose centre; Regalia, deep rose pink, large; Sylvanus, flowers good form, full purple; Uriah Pike, very handsome, good crimson; William Robinson, the best scarlet; Winter Cheer, bright scarlet.

To these may be added Duchess Consuelo, a good yellow, and also Cecilia. The last-named produces flowers as large as the Malmaison, and of excellent quality, but neither of them are true perpetual; they may be classed in the same category with Uriah Pink and Primrose Day. All of them flower well if forced in the spring months, whereas all the others I have named are valuable as filling up the time between the passing away of the border Carnations in the early autumn and the advent of the Malmaisons in spring.

Diseases and Insect Pests.—The most troublesome and persistent is the "Rust" (*Helminthosporium echinulatum*), a fungoid growth which develops between the membranes of the leaves; it ultimately bursts and scatters its coffee-coloured spores. There is no cure except to cut off the affected leaves as soon as the disease is noticed. The next disease is "Spot" (*Uredo dianthi*); it is not so deadly, nor is it really infectious. The plants should be placed in a light and airy position, and in as dry an atmosphere as possible; the parts attacked should be cut off. I find it useless to dip or dust the plants. Another very troublesome pest is the "Eel worm" (*Tyleuchus*). This is a minute nematoid worm, which produces the disease known as "gout." The worms attack the collar of the plant, causing it to swell; they seem to eat their way up the stem, and ultimately kill the plant. When they have made a lodgment in the plants there is no cure; best destroy the plants and remove the soil.

The Carnation maggot (*Hylemyia nigrescens*) is very troublesome, and sometimes does much damage to the plants. It does more mischief to those planted in the open garden than to those in pots. It is the larvæ of a small dipterous black-fly, which greatly resembles in appearance the house-fly; it is generally found in the centre of the plants, and it eats its way down until the heart is totally destroyed. It is easy to see where the depredator is at work, and it can be dug out with a needle. Wireworm is the larvæ of a small beetle (*Agriotes lineatus* probably). In the larval period they remain in the ground from three to five years. A full-grown

TREE AND OTHER INDOOR CARNATIONS AT EDENSIDE.

wireworm is about an inch long, of a yellow colour, hard and wiry to the touch. They work underground and eat into the stem, working up the centre of the plant, and the first sign of its being there is the decay of the leaves. By that time the worm has gone into the ground again, and is probably engaged on another plant. For pot plants it is best to look the potting soil well over when it is being mixed. In the open garden a good plan is to dig in a coating of fresh gas lime about six months before planting out the Carnations. Slices of carrots inserted in the soil attract the wireworms; these traps may be examined three times in a week and destroyed.

Aphides, or green-fly, if allowed to increase, do more mischief than most people imagine; they suck the juices of the plants, and cause them to become polluted by their excrements, the leaves becoming dirty and sticky from the glutinous substances. They spread rapidly in warm weather, but can always be destroyed with tobacco smoke, or the plants may be dipped in a solution of soft-soapy water, two ounces to the gallon. This will also kill them.

The small yellow thrips are also most troublesome on the choice show Carnations, and quite spoil the beautiful Flakes and Bizarres. The pest attacks the unfolded petals of the Carnations even before the colour is seen bursting from the calyx. The white ground Picotees are also much disfigured by it. As soon as the plants can be taken into the greenhouse and smoked the insects are killed. It is always more frequent upon pot plants than upon those grown in the open garden.

SWEET VIOLETS AND THEIR CULTURE

The fragrant Violet of the shady bank and wayside is welcome always, and of late years many beautiful forms have been raised with flowers almost as large as a Pansy, and filled with richest odour. Many possessors of quite small gardens grow them with success.

The soil, position, or treatment afforded must be bad indeed when Sweet Violets fail to grow; but even when the two former leave nothing to be desired, a feast of bloom throughout the winter is not always obtained. It is only the skill of the grower that makes the plants flower well during the short, sunless days of winter. In the following notes I will endeavour to give some practical hints which may assist others to grow Violets to perfection.

Outdoor Violets.—*Soil*—Violets will grow in almost any soil, though, in common with most other plants, they succeed

better in some than in others. The plants will grow and flower freely in any ordinary garden soil, and that which will produce good vegetables will be found equally suitable for the growth of Violets. In preparing the bed or border to receive the plants do not charge the soil with a mass of rank manure, as this in all probability would lead to much leaf growth and few flowers, the latter being in small proportion to the foliage. Those who have a light, hungry soil to deal with might improve its staple certainly by digging in some thoroughly decayed cow manure. This while feeding the roots would tend to keep the ground cool and moist during summer, no small feature in successful Violet culture. The Violet does not grow naturally in a place where rank manure prevails; the plants require rather shade and moisture, and a soil rich in humus, viz., the accumulation of decaying leaves for many years. A free addition of leaf-mould is an advantage, especially to heavy soils that are inclined to bake and then crack under the influence of the sun. The presence of decayed leaves in the ground would prevent this, while the roots would revel in what is naturally their chief rooting medium.

Some growers are so situated that they find it is difficult to secure either cow manure or leaf-mould, but the Violet is not particular, thriving quite as well when the site is dressed with what we may term a mixed compost. The ordinary rubbish heap contains more valuable plant food than many imagine, especially after all the nondescript material has gone through a process of decay, the germinating power of the seed of weeds destroyed, and the whole turned and well mixed. A good heap of such compost may be used with advantage for most flowers, and none would succeed better than Violets. Of other suitable dressing mention might be made of spent mushroom dung or the remains of an old hot-bed. Lime, wood ashes, or fresh horse droppings should be avoided, as these are not moisture-holding agencies, therefore they are not suitable for the plants under notice. Whatever dressing is used should be dug into the ground deeply some time before the plants are put out.

Position of Beds.—In summer while the plants are making their growth a shady spot is best, or partially so, as the foliage, being so liable to the attacks of red spider, is more likely to become infested in a hot, dry position than if the plants are grown in a cool and shady one. North or east borders should be selected, or the shady side of a hedge, between fruit trees and bushes, or any position where the plants will receive shade during the heat of summer. In such places, too, the plants often produce an abundance of

flowers in autumn, and give a wealth of bloom in spring, but to maintain a continuous supply throughout the winter the plants must be lifted in September and planted in the warmest and most sunny spot in the garden, such as at the foot of a south wall, or in frames. Thus while the plants require shade and moisture during summer, all the sun possible should reach them throughout the winter months.

Raising Young Plants. — Violets should be propagated annually. It is natural for the plants to increase rapidly, the same as the strawberry, by means of runners. When strawberry plants grow at will, the beds the second year are one mass of foliage crowded together, so thickly do the runners appear and spread, and there is little or no fruit. So it is with Violets, and instead of the beds being an entangled mass of side shoots, each plant should be grown separately and quite a foot or more apart. Then by nipping off the runners during summer strong individual crowns or clumps are formed, which not only produce fine flowers abundantly and on long stems, but which are more valuable for arrangement when cut. A limited number of the plants, however, should be reserved for stock purposes, allowing these to form runners, which become rooted in the ground. The desired number should be severed from the parent plants, with a lot of roots attached, and transplanted in properly prepared beds. If these are to flower in the open, plant fifteen inches apart each way. Water and syringe frequently if the weather is dry after planting. Keep the soil hoed, and then they will soon become established.

New plantations should be made in autumn for the following reasons: First, the plants are more easily and quickly established in September than is possible say in March, when there are often trying winds and a bright sun. Then, again, the plants should be in full flower in the latter month, and one is reluctant to disturb them for increasing the stock, while if propagation be delayed until after the flowering period, the season is too far advanced, and the weather generally too hot for the divisions or offsets to make any progress, and they either remain stunted during the summer, or, what is worse, many may fail to grow at all. Some growers simply pull the old plants to pieces in spring, and dibble out the divisions. Many of these have hard woody stems and few fibres, and unless the weather is mild and showery such divisions fail to start. How much better then must it be to have a reserve of young, clean, and well-rooted autumn-struck plants. If it is necessary to transplant these in spring there will be no risk, as each plant can be lifted with a good ball of earth, and they

begin to grow at once in their new quarters. Such young stock would probably show flower buds, but these should be pinched out, as the established beds would furnish the supply. If, after planting, a slight mulch of decayed manure could be spread about the plants so much the better, as subsequent rains would carry the manurial properties down to the roots, and the residue on the surface would greatly assist to keep the ground cool and moist during a hot and dry summer. During the summer encourage leaf growth free from red spider. Keep the runners picked off and the ground between the plants free from weeds. Treated in this way the plants will not fail to give a wealth of bloom in due season.

Violets in Frames.—However good the summer treatment may have been, or how strong the plants may be by autumn, a continuous supply of bloom throughout the winter cannot be maintained without some protection.

Violets in Winter.—Temporary frames may be placed over the beds, but then the shady position the plants occupied during the summer would be against free-flowering throughout a season of dull short days. Therefore, the plants should be removed to a more sunny one and planted in shallow frames — an ordinary portable frame, such as is generally used for growing cucumbers in during the summer; indeed a bed that has been used for this purpose requires little alteration to receive the Violet plants. The hillocks need only be levelled down, and the soil trodden somewhat firmly and the Violet plants put out say one foot apart. Of course, we are supposing that the soil in the frame will not be more than eighteen inches from the glass. The nearer the plants can be brought up to the glass the better, so that every ray of sunshine shines on them. The frame, too, should have a sharp pitch and face south. This will allow of rain or snow passing off quickly, and then there is less fear of the foliage suffering from damp or mildew. The Violet is hardy, and resents fire heat, protection is all that is needed; and when severe weather is anticipated, pack leaves, bracken, straw, or stable litter round the sides of the frame, and the cover lights with double mats to keep out frost, and the plants are more likely to succeed in such quarters than in heated brick pits.

The plants should be exposed fully whenever the weather permits. Even in wet weather tilt the lights well at the back, harsh winds, frost, and heavy rains being guarded against, and ventilation afforded accordingly. These are the simple lines upon which to work, and by getting the plants placed in the frames the first or second week in September, flowers

HARDY NYMPHÆAS (WATER LILIES) IN A TANK.

may be expected in October, and by having several varieties a succession of bloom is maintained until the end of April.

The best Varieties for the open are undoubtedly the single ones, though the double Marie Louise and Lady Hume Campbell might be included in the collection. Among the single varieties mention must be made of two rather new ones which deserve wider cultivation, viz. : Princess of Wales and California. Both grow strongly, and should be allowed plenty of space for their large leaves to develop. The flowers are also very large and borne on long stems ; when cut they can be used with greater taste than is generally seen in the arrangement of cut Violets. Victoria Regina is an old favourite, and having these three one need not seek further in forming a collection. With the doubles, many amateurs call all these the Neapolitan, but the true variety has pale lavender-coloured blooms with a white centre. They are very fragrant and pleasing, and appear freely in frames during the winter, but they have rather short stems. We rely chiefly on Marie Louise, rich lavender mauve blue, with a white eye, a general favourite, which flowers continuously until spring. Then there is that beautiful late variety, Lady Hume Campbell, which makes a good succession, and so prolongs the season of Sweet Violets, not perhaps to the extent many would wish, but certainly over a period that it is possible to induce the plant to bring forth those deliciously scented flowers of which we never tire.

WATER-LILIES IN TUBS

In a book for beginners Water-lily culture in lakes and ponds does not come within its scope. Without large or small expanses of water it is, however, quite possible to enjoy these glorious water flowers, rich jewels of the streams of America and our own land, and some not native of any country, but given to us by the hybridist. Many of the hardiest and most brilliant of the Nymphæas are the hybrids and varieties. The various kinds differ greatly in growth and in the size of their flowers. Some are of remarkable strength, the Marliacea hybrids as an example—*Marliacea albida, carnea, chromatella*—whilst others are quite small, little gems of the water surface, *Nymphæa pygmæa Helvola*, and others. The smaller forms are naturally most suitable for tubs. We must unquestionably give to M. Latour Marliac much of the credit due to the raising of new Nymphæas. He gave to us Water-lilies with flowers of many colours—white, yellow, pink, rose, and red —all as hardy as the Lily of our rivers and back waters,

the beautiful white *N. alba*. Doubts have been frequently expressed as to their hardiness by those who have not grown them, not, however, by those with practical experience of their behaviour in even severe winters.

When grown in tubs it is necessary to give some protection from frost, more so than in the lake or pond, where the ice in winter acts as a protective agency unless under exceptional circumstances, when, as an example, the water is frozen through solidly. The way to proceed in commencing Nymphæa growing in tubs—and it is a fascinating pastime—is to sink the receptacles in the soil. The plants are then less exposed to danger, and when very hard weather sets in, a covering of straw or bracken will make them safe. When the tubs are on the level it is wise to bank up the sides with soil during the winter, applying an overhead covering according to the weather.

The size of the garden is a matter of small consideration. Quite amateur gardeners may grow Nymphæas in tubs, and they give little trouble. Procure sufficient casks or barrels to hold the plants. Cut each into two in the middle, and make sure each part is fairly water-tight. A hole must be made and plugged up, as it is necessary to have a means of letting off the water. It is an excellent plan also to have some larger tubs, so that they may be of varying widths, from eighteen inches to three or even twenty feet. For the strong growing hybrids large tubs are essential, but it is a mistake to grow very robust Nymphæas in this way, as they are too vigorous and seldom give satisfaction.

When the tubs are ready place them if possible at different levels, and arrange for an overflow of water from one tub to those below, and this may be managed by providing a tap from which water is allowed to drip into the highest tub. A constant stream of water is provided, flowing downwards very slowly, but sufficiently fast to prevent stagnation. The water must flow slowly and remain exposed to the air for some time to gain warmth. It will, of course, be found that the water is very cold in the highest tub, but gradually becomes warmer on the way down. This is as it should be, as a regular rise of temperature all the way down is essential.

If the water runs through too fast the plants will not flourish, the temperature being too cold and the water too hard.

Preparing the Tubs.—In preparing the tubs to receive the plants, drainage first claims some attention. As it will sometimes be necessary to remove the plug and allow the water to run off, drainage must be provided. It should be about

the same as that given to pot plants, and may consist of broken pots, pieces of brick, and similar rubble. Water-lilies flourish in the rich mud of ponds and rivers, and good soil should therefore be provided. Perhaps the exact nature of the soil is not important provided that it is good. Sometimes it is possible to obtain rich pond mud ; if so, dilute it with other soil, so as not to encourage a too luxuriant growth of foliage. Good loam mixed with leaf-mould answers well, and road scrapings should be mixed in to lighten it. When the soil is poor use some manure, such as bone-meal, mixing it in before placing the soil in the tubs. As a rule artificial manuring is quite unnecessary.

When the plants are received from the nursery unpack them at once and place under water. In the case of the smallest varieties, such as *N. pygmæa Helvola*, a depth of two or three inches below the surface of the water is sufficient; but there are very few kinds so small, several inches, say six inches to ten inches, being the general regulation distance.

Planting.—This may be carried out from the end of April until the end of May. When warm weather prevails planting may commence at once. Established plants begin to bloom in the early part of June, but plants fresh from the nursery will not flower until July unless the plant is very strong. The Nymphæas will grow well if they are put in even later in the summer. A plant put in during September would not die, but remain dormant in winter and start into growth in spring. When Water-lilies are in a pond their chief enemies are voles, or water-rats, that sometimes eat the tubs, and the water-fowl play havoc with their leaves. These enemies would be less likely to make an attack when tubs are used, though the rats might discover the Nymphæas when the tubs are close to a pond in which they have made their home. It is a good plan to keep small fish, such as goldfish, in the water, especially when a small tank is available, in which two, four, or six plants may be grown, instead of the tubs.

The Blue Nymphæas.—If a greenhouse be available, the tubs, or some of them, may be placed there, and in this way tender kinds may be grown, such as the beautiful blue *N. stellata*, or *N. cærulea*, as it is called on the Continent. This is the blue Lotus of the Nile, held sacred by the ancient Egyptians. A plant carrying from six to twelve fully expanded flowers is a rich picture. It is quite worth trouble and expense to grow this Nymphæa well. In very favourable places, as in Cornwall and Devonshire, it may occasionally be flowered in the open air, without even giving the plant warm water, but it must be taken inside for the winter. Another

way of affording extra protection and warmth, so that the blue varieties may be flowered, is to put the tub in a frame. If desired the hardy kinds may be forced by placing them in a warm frame or greenhouse in the spring.

Arranging the Tubs and Water Plants.—Much might be written about the arrangement of the tubs and their surroundings. They should, if possible, be grouped together with wet, boggy ground between them, and it would perhaps be necessary to obtain the bog by means of additional tubs containing constantly wet soil, either covered with water or not. In the bog could be planted the common Reed Mace (*Typha latifolia*), Marsh Forget-me-not (*Myosotis palustris*), *Primula rosea*, *P. japonica*, Japan Iris (*I. Kæmpferi*), and similar moisture-loving plants, which would almost hide the tubs. In some of the tubs, in addition to the Nymphæas, grow the fragrant Cape Pond Weed (*Aponogeton distachyon*), the Flowering Rush (*Butomus umbellatus*), Sagittarias or Arrowheads, *Calla palustris*, *Ranunculus Lingua* (the Great Spearwort), and the native yellow Nuphar. The Nymphæas will appear to greater advantage with this framework of moisture-loving flowers.

The Selection.—Our first choice, after the beautiful wild Water-lily of our stream-sides and back waters, would be *Nymphæa pygmæa Helvola*, which is quite a pigmy kind, and therefore especially suitable for a tub or tank. The flowers are yellow, with stamens of a deeper shade, and when fully expanded measure about three inches across. It is so free that a single plant, with a width of not more than eighteen inches, will have expanded upon a warm July day twelve and even more flowers. The leaves, too, are pretty, being little larger than the flowers, and marbled with reddish brown. A tub eighteen inches across provides ample room for this variety. It was raised by M. Latour Marliac, and increases so readily that it is more easily obtained than its parent Pygmæa, a small white Nymphæa, which is quite worthy of a small tub, fountain, or tank.

Another white Lily worth growing in tubs is the white form of *N. caroliniana*. It has a very pretty, moderately-sized flower of refined shape, and is not of rank growth. The only other hardy yellow-shaded Nymphæas are *N. chromatella*, which is the yellow form of *N. tuberosa*, and *N. odorata sulphurea*. They are noble Water-lilies, but too vigorous for tubs. The former should be chosen in preference to the latter, and should succeed well, but the result would be disappointing to those who know the plant in an open pond or lake, where it has space to extend. *N. flava*, the Mexican yellow Nymphæa, should be avoided; it is not hardy, and

HYBRID WATER LILIES (NYMPHÆAS) IN TUBS UNDER FRAME.

unsatisfactory even in a greenhouse. It is sometimes described in trade catalogues as hardy, but it is not so.

Of flesh-coloured Nymphæas the best for our purpose is probably *N. caroliniana perfecta.*

Of pink and rosy-pink colours avoid *N. alba rosea,* which is rare, expensive, and gives sparingly of its flowers. The most suitable will be *N. odorata rubra* (syn. *rosea*), the North American pink Water-lily, *N. odorata rosacea, N. odorata exquisita,* and *N. Laydekeri rosea.* The three last are hybrids of M. Latour Marliac. The flower of *N. odorata exquisita* is deeply coloured, small, and pretty. *N. odorata rosacea* is paler and larger. *N. odorata rubra* is intermediate in colour between these, but the flower is rather coarse. When only one kind is required choose *N. odorata exquisita. N. Laydekeri rosea* is very distinct, but difficult to propagate ; it should not be disturbed from year to year. When freshly expanded the flowers are pale pink, but become deeper on the second day, and still more so on the following day. This is a desirable kind in every respect and keeps well within reasonable limits. *N. Seignoureti* is also suitable ; the leaves are rather small, but produced in profusion, their surface being mottled with brown. The outer segments of the flower are pale yellow and the inner ones rose. The flowers stand up fully six inches above the water.

Many beautiful varieties range through various shades of red, but the majority can only be obtained at quite fancy prices. *N. Ellisi, N. gloriosa, N. Marliacea rubro punctata,* and *N. lucida* are magnificent, but require more space than a tub. *N. ignea* and *Laydekeri* kinds should be chosen in their place. *N. Froebeli* is of moderate growth, the flowers very dark in colour and of good shape.

The following interesting notes appeared in the *Garden* about Nymphæas. It is mentioned that with regard to the depth of water needed, at least eighteen inches is needful for some of the stronger growing kinds, such as *N. Marliacea chromatella.* If the water is too shallow the leaves are sometimes raised above it, and the flowers are partially hidden. "In shallow water the flowers are more widely scattered than where they have sufficient water for the stems to grow upright. I have to use cold spring water, which is rather hard, but it is properly diluted with that already in the tank, so that it is not injurious.

"It may be of service to say that there is no need for a constant flow of water. My tanks have no outlet, and are supplied as they need replenishing from the well in the garden, there being a small artificial watercourse from the pump by which the water flows into the tanks. When first filled the

tank water becomes green, but it soon clears itself, and if a little of the green conferva which grows is left it remains pure and clear. I find it better, however, to fill with fresh water in spring, after the frost has gone.

"For a tank of six feet by six feet I should not have more than two plants, except of the Pygmæa section, or such as *Laydekeri rosea*. My larger tank is about nine feet by seven feet, and I find that three Water-lilies are too many for it. I purpose keeping in it in future only *N. Marliacea carnea* and *N. M. albida*.

"May I also suggest that those with only small tanks should be careful in the selection of plants for the margins. Every ray of sun is valuable if we want to have the best results, and planting tall plants on the margin inevitably causes shade where the tanks are so small. Gunneras, Irises, Spiræas, and other plants of similar size should be planted a little from the margin, leaving the latter for such plants as *Primula rosea* and others of low growth.

"In a tank such as that referred to nothing should be grown but the Water-lilies. Other things may do very well for a year or two, but there is not space enough for all, and the Water-lilies would eventually suffer. Even with these limitations, a Water-lily tank of small size adds much to the pleasures of a garden."

DAHLIAS

There are many groups of Dahlias, as the following selection of varieties will show, but probably the Cactus kinds are more thought of than any other, their strangely picturesque form, brilliant and varied colouring, and usefulness for cutting, bringing them into greater prominence than the more formal "show," or so-called "decorative" kinds. Each year many beautiful additions are made to the Cactus Dahlias, and gradually an unpardonable blemish in their character is being removed. The flowers of many handsome varieties hide themselves amongst the leaves as if loth to appear in full sunshine. Of course, the effect of the plant is that of leaf with a glimmering of colour from the half-hidden flowers. Raisers must try and remedy this defect.

Culture.—Dahlias delight in rich deep soil—inclined to be heavy rather than light—and ample drainage is essential, because frequent waterings are necessary during drought. Never plant in positions overhung by tall trees, or spindly growth and few flowers will be the result. Get the plants out im-

A VASE OF CACTUS DAHLIA FLOWERS.

mediately all fear from frost is over, but the end of May will be quite early enough, or even the first part of June in cold places. The young succulent growths of the Dahlia quickly suffer from low temperature, and as the month of May is sometimes very treacherous, the young plants should be given slight protection at night. Spring-rooted (young) plants are preferable to old roots. When the plants are thoroughly established in their permanent quarters, a stout stake should be driven into the ground a little distance from the main stem. This must be securely tied with strong tar twine, and four or five thinner stakes placed round each plant. Carefully tie out the flower producing branches. Keep the centre of the plants well thinned out so as not to impede light and air, so important in the production of shapely flowers. If the latter are required for exhibition limit each shoot to one flower, all the others, of course, being removed in the early stages of development. Dahlias must not be crowded, five feet apart each way being not too much for kinds of vigorous growth. It is more satisfactory to give a few plants proper room to develop than to grow double the number on a space sufficiently large for half the number. In very dry seasons a mulching of decayed manure is advisable to prevent moisture in the soil escaping too quickly. When the flower-buds are formed applications of liquid manure are beneficial.

Propagation.—Of the several ways of raising Dahlias only two are practised on anything like a large scale. These are (1) by cuttings, and (2) by seed. In order to raise plants from cuttings take the old roots in spring, generally about the middle or end of February, and plant them in pots or boxes, or on a bed of ordinary soil on a shelf near the glass, in a temperature of about 60 degs. After planting give a good watering and occasional dampings until growth begins. When the shoots are a few inches long, take them off as near the roots as possible and insert each one in the centre of a small thumb-pot, after which remove to a hot-bed or a close case with bottom heat. Plunge the pots to the rim, water overhead, keep the lights close, and protect from the sun by mats, tiffany, &c., rolled over the glass. When rooted through, which will occur in a fortnight's time, they should be taken to cooler quarters and grown on in larger pots. Before planting-time the plants should be thoroughly hardened off. Stand them in a cold frame, and a week or so before planting-time remove the lights altogether.

Raising from Seed.—Dahlias are raised readily from seed sown in February or March in a brisk heat. When of sufficient size the seedlings should be planted in small pots and

treated in exactly the same way as recommended for the rooted cuttings.

Insect Pests.—Dahlias have their enemies, and earwigs are among the most troublesome. They may, however, be kept under by placing a little moss or hay in three-inch flower-pots and inverted on the tops of the main stakes. The pots should be examined every morning and the earwigs destroyed.

Storing the Roots in Winter.—It is unusual to lift the plants until the growths have been destroyed by frost, usually in November, then cut the stems down to within five inches or six inches from the soil, lift the roots carefully and shake the soil away. When the roots are dry, each variety should be properly labelled, and placed in a warm, dry, airy place such as a shelf in a potting shed, greenhouse floor, &c.

Cactus Varieties.—The following are beautiful Cactus Dahlias :—Alfred Vasey, flowers orange-yellow, touched with light salmon, very free; Austin Cannell, reddish mauve, touched with crimson near the base of the long narrow petals; Brema, pink, with a delicate peach centre; Britannia, pale salmon-pink, flushed with apricot—the florets are long, narrow, and incurve beautifully; Cannell's Gem, bright orange-scarlet; Charles Woodbridge, intense crimson, tipped and suffused with purple; Countess of Lonsdale, delicate salmon-pink, tipped and suffused with apricot; Crimson King, rich crimson, touched with scarlet near the tips; Cycle, bright ruby-red, tipped with carmine; Dr. Jameson, brilliant crimson, suffused with warm purple; Exquisite, light-orange, distinct and very free; Falka, carmine, suffused with crimson; Fusilier, orange-scarlet, suffused with coral pink; General French, bright terra-cotta or orange-red; Gloriosa, rich scarlet; Green's Victory, glowing scarlet, touched with crimson; Henry Ayres, deep crimson, tipped with purple; Iona, terra-cotta passing to orange; Island Queen, lilac, suffused with mauve; J. E. Frewer, vermilion; John H. Roach, rich yellow; Juarezii, crimson-scarlet; J. W. Wilkinson, crimson or ruby-red, tipped with rose; Keyne's White, white; King of Siam, purple, touched with crimson-maroon, very free; Leonora, rich rose, suffused and tipped with pale pink; Lord Roberts, cream-white, with a deeper centre; Lyric, bright scarlet; Magnificent, soft salmon-pink, shaded with apricot; Mary Service, exquisite shade of heliotrope, the basal portion of the petals yellow; Matchless, maroon, touched with purple; Miss A. Nightingale, terra-cotta and yellow; Miss Finch, carmine-rose, shaded with crimson; Mrs. B. Barker, purple passing to a lighter shade; Mrs. H. Cannell, rich scarlet, shaded with amber; Mrs. John Goddard, glowing crimson;

Mrs. J. J. Crowe, rich yellow; Profusion, rosy purple self, very free flowering; Progenitor, rich scarlet, suffused with purple, petals broad and forked at the tips; Ranji, deep velvety maroon, petals long and narrow; Robert Cannell, rosy carmine; Rosina, bright rosy red, with paler shadings; Ruby, ruby red, tipped and shaded with carmine; Starfish, orange-scarlet, a superb flower for form; Stella, rich scarlet, suffused with crimson, very free flowering; Tillie, salmon, tinged with rosy mauve; William Cuthbertson, bright scarlet, touched with carmine, very free.

Decorative Cactus Varieties.—Baron Schroder, purple; Constance, white, free flowering; Grand Duc Alexis, large, white; Henry Patrick, pure white; Miss Jane Basham, orange, touched with salmon-pink; Orange Glare of the Garden, rich orange-red, unusually free flowering; Rayon d'Or, bright orange, the centre of each petal striped with white; Salisbury White, pure white, very floriferous. These are not of the true Cactus type.

Pompon Varieties.—Alwine, pink, touched with heliotrope; Annie Holton, crimson, tipped with white; Arthur West, crimson; Bacchus, brilliant scarlet; Ceres, pale primrose-yellow; Claribel, pale pink, edged and suffused with rosy purple; Dagmar, deep maroon, shaded crimson; Darkness, maroon; Dr. Jim, very pale purple, edged with a deeper shade; Doris, rich rose, flushed with purple; Fairy Tales, clear primrose-yellow; Fashion, rich orange; Ganymede, amber-yellow, tinted lilac; George Brinckman, pure white; Hilda, rosy purple, edged with cream-white; Iris, yellow, flushed with pale salmon; Katie Parnham, light purple, shaded and edged with rosy purple; Little Sweetheart, scarlet, slightly edged with white; Mars, very bright scarlet; Midnight Sun, crimson-maroon; Model, light pink, suffused and edged with deeper shadings; Nemesis, maroon; Nerissa, rose pink, faintly suffused with white; Opal, lemon-yellow, edged with white; Phœbe, rich golden orange, suffused with scarlet; Red Indian, scarlet; Sunny Daybreak, pale apricot, tipped and flushed with red; Thalia, deep lilac, with a white centre; Whisper, rich yellow, edged and suffused with gold. The beginner should get White Aster, snow white, one of the most valuable of all Dahlias for cutting and for the garden, and Zerlina, deep crimson, almost maroon. The Pompon is quite an old world group, and most useful for cutting.

Single Cactus Varieties.—Althea, deep crimson; Brenda, chrome yellow, twisted petals; Fair Maid, delicate pink, passing to a deeper tint; Guy Mannering, cream white, with a paler centre; Maid of Bute, rose-pink, distinct and showy;

Meg Merrilies, rich yellow; and Queen Mary, pure white. These are very pretty flowers for cutting.

Single Varieties.—Charles Parrot, deep maroon, margined with crimson-scarlet; Cleopatra, rich crimson; Columbine, rose-pink, touched with orange near the centre; Daisy, rosy crimson, variegated with white; Demon, deep maroon; Duke of York, bright orange scarlet, with a yellow circle round the disc; Eric, rich scarlet suffused with rose towards the tips; Flame, rich orange yellow, striped and splashed with scarlet; Folly, pink, tipped and shaded with rose; Girlie, cream, margined with red; Goldenlocks, bright yellow; Gulielma, white, edged with yellow; Leslie Seale, pink, with a distinct crimson band near the yellow disc; Nellie Nicholson, white edged with rosy red; Puck, orange or bronze-yellow, with a crimson ring round the disc; Shamrock, crimson-maroon, tipped with rose; Trilby, velvety crimson, distinctly tipped with pink; Veronica, scarlet, tipped with amber; White Queen, pure white.

Show Varieties.—Arthur Rawlings, deep crimson; Cherub, deep amber; Chieftain, purplish lilac; Daniel Cornish, red, suffused with orange; Duchess of York, lemon-yellow, tipped with salmon-pink; Empress, lilac-purple, splashed with crimson; Florence Tranter, blush white tipped with rosy purple; Gracchus, orange-yellow; Gwendoline, bright crimson; Harbinger, lilac-pink; Harry Keith, rosy purple; James Cocker, purple; J. T. West, yellow, edged with purple; Marjorie, bronzy yellow, flushed and edged with pale purple; Mrs. Gladstone, pale blush; W. H. Williams, brilliant scarlet.

Fancy Varieties.—Comedian, orange-yellow, speckled with crimson and edged with white; Frank Pearce, clear rose, splashed with crimson-scarlet; Frederick Smith, lilac, striped with purple; George Barnes, rosy lilac, streaked with crimson; Golden Fleece, yellow, speckled with crimson; Gold Medal, rich canary yellow, striped and splashed with red; Heather Bell, crimson, tipped with white; Matthew Campbell, apricot-yellow, striped with crimson; Novelty, blush white, streaked with rose-pink; Peacock, purplish maroon, edged with white; and Watchman, yellow, speckled and striped with crimson.

CACTI FOR AMATEURS

Thirty or forty years ago, Cacti were far better known than at the present time, though during the last few years a decided change has taken place in their favour. It is hard to understand why in so many places their cultivation should be ignored, for although they may not

CEREUS TRIANGULARIS ON THE ROOF OF AN ALMOST COLD HOUSE.

be "decorative," in no other class of plants do we get such curious, weird, and fantastic stems, such wonderful arrangements of spines, or, in numerous instances, such lovely flowers. The flowers of the night-flowering Cereus are powerfully fragrant, a foot or more across, rich in colour and exquisitely formed, springing apparently from dried-up branches. In Phyllocactus we get large, rich-coloured flowers springing from the sides of small flat branches, and in Epiphyllum long, waxy, bright-coloured flowers in such profusion as to hide the branches. Cactus culture is a good hobby for beginners.

Cultivation.—In the first instance, though a large house is advisable for anything like a complete collection, from the slow growth of many, little room is required, and large numbers may be grown in a small house; or if a house is not to be had, a considerable number may be grown in a cold frame, in a glass-case in a room as ordinary winter plants, or, if a warm sunny position can be found, a few may even be grown out of doors. Again, as they are natives of hot, dry, desert regions, they are not so susceptible to injury as many other things if watering cannot be attended to regularly, and they occasionally become dry; in fact, with a few exceptions, no water at all is required for at least six months of the year. Then again, being of slow growth, repotting is necessary only at rare intervals. Except in one or two cases which will be mentioned later, the following method of cultivation will be found satisfactory:—The majority require a minimum winter temperature of from 50 degrees to 55 degrees, rising on sunny days to 60 degrees. During summer no shading should be given, and the temperature, without fire heat, allowed to rise as high as possible, giving a free circulation of air. Throughout the growing season, from the end of April to the end of July, plenty of water will be required at the roots, with medium syringings overhead twice daily. After the later date, water must be gradually withheld, none at all being given after the middle of September throughout the winter. Repotting should only be done when the pots are thoroughly filled with roots, or when the soil seems to be in bad condition. In the latter case, all old soil should be washed from the roots. April is the best time to repot. The compost should have as its principal part good fibrous loam, adding to every five parts one-part of sandstone or broken bricks, crushed to the size of a walnut, and from that size downwards to dust. As small pots as possible must be used, filling them nearly half-full of crocks. Any plants that have well filled the pots with roots should be assisted with occasional applications of weak liquid manure.

When it can be managed, better results can be obtained by forming a rockery in the house, and planting everything out, and too much cannot be said in praise of this method. In this way they grow much quicker, are more at home, and infinitely more pleasing to the eye than when placed in rows of pots. Many are particularly well adapted for planting in crevices between stones, and grow much better in this way than in pots.

Propagation may be effected by means of seeds, cuttings, or grafting. Seeds should be sown as soon as received, and when the tiny plants are

large enough to handle, prick them off in a bed of sandy soil in a sunny position near the glass. Cuttings should be allowed to dry for several days before insertion in sandy soil. Very little water must be given until they are rooted. Cuttings from an inch long to several feet may be used. Grafting is resorted to in a few instances only, and will be mentioned later.

Insect pests are best kept under by means of fumigating, and by the use of insecticides. A useful insecticide is made by mixing a quarter of a pint of paraffin in four gallons of strong soft soap water. Mealy bug and thrips are the two worst insects.

Cacti that have been injured during importation, or from other causes, and are beginning to rot should have all decayed matter cut away, and be painted with carbolic acid or Condy's fluid several times, and left in a sunny position until thoroughly dry. Afterwards an occasional dusting with charcoal will keep them right.

Turning to the

Selection of Suitable Plants, the most worthy are found in the following genera :—Cereus, Echinocactus, Epiphyllum, Mamillaria, Melocactus, Opuntia, Pereskia, Phyllocactus, and Rhipsalis. With few exceptions they are confined to South America and the West Indies, the headquarters being California, Mexico, and Texas. Of

Cereus alone—in which the three genera, Echinocereus, Echinopsis, and Pilocereus, have been merged—nearly two hundred species are in cultivation. The different species vary greatly in habit, some being but a few inches high, and forming dense tufts of spiny growths, others, as in the case of the Giant Cactus of California, making tall, massive, sometimes single, sometimes branched, columnar stems several tons in weight. Another section—well represented by the Old Man Cactus (*Cereus senilis*)—makes tall stems, terminated with a large mass of long white hairs ; while yet another is well marked by having long, thin, climbing, or scandent stems. In some instances the stems are nearly round, and slightly angled ; in others they are very deeply ribbed or angled, and in most cases they are very spiny. The flowers are borne from the sides of the stems in summer, and in many cases are very showy. Particularly is this the case with a number of climbing species which are known as "night-flowering Cacti." Of the many species the following are all worth growing :—

Climbing, or scandent kinds, which usually flower in the night, suitable for training on a roof: *C. grandiflorus, Lemairii, Macdonaldiæ, Napeoleonis, rostratus,* and *triangularis.* All these produce flowers from ten to thirteen inches across, ranging in colour from yellow and white in the two last named to the same colours tinged with red in the others. In addition, the Rat's-tail Cactus (*C. flagelliformis*), which flowers in the day-time, makes long, thin stems, which produce pretty, small pink flowers freely ; it is an excellent basket plant. Of tall, strong growing species : *C. giganteus, glaucescens, Jamacarii,* and *Peruvianus* are useful ; the former, and the two latter, have white flowers which open during the day. In addition, *C. senilis* is remarkable for its long white hair ; although usually seen a foot or so high, it will grow to a height of ten feet or more.

Echinocactus is characterised by short, thick, globular, deeply-ribbed stems, usually unbranched and covered with tufts of stiff bristles and stout-hooked spines. A few of the most conspicuous of a large number of species are : *E. Lecontei*, with a thick, globular, angled stem, covered with tufts of grey bristles and strong rosy-red spines, two to four and a-half inches long ; *E. Wislizeni*, a large round plant, with long, wide, dull brown spines ; *E. Grusonii*, a large, round plant, thickly covered with bright yellow spines ; *E. ingens*, distinct by reason of its almost round spines ; and *E. cornigerous*, *electracanthus*, *Emoryi*, *Haselbergii*, *horizonthalonius*, and *Pfeifferi*.

Epiphyllum is a family characterised by much branched, flat, short-jointed stems, the flowers being produced abundantly from the ends of the branches in November and December. It requires a closer and moister atmosphere than most Cacti, and should never be kept without water. As the several species are found growing naturally on branches and in forks of trees, a lighter soil is necessary for them. They are sometimes grafted on tall stems of Pereskia, or they may be grown in baskets, or on rafts. When on their own roots a mixture of peat, charcoal, and sand is suitable. In a moist warm house, grafted plants can be grown six feet high, several feet through, and thoroughly clothed with branches from the pot upwards. The flowers are bright coloured, thick and fleshy, and somewhat resemble in shape those of a Salvia. *E. Gærtneri*, with scarlet flowers, *E. russellianus*, with rose flowers, and *E. truncatum*, with red blossoms, are showy species. Of the latter, a large number of garden forms are in cultivation, varying in colour from purple, rose, and salmon, to white.

Mamillaria.—This genus is characterised by having intensely spiny stems, and by having the whole stem covered with small bulb-like tubercles. Between the different species there is a wide variation in habit. Almost all are of small stature, some making a cluster of small stems an inch or two high, others making stems a foot or more high which rarely branch, while another set form round thick stems, three or four inches high, and of the same diameter. Of the taller ones, *M. sulphurea*, covered with softish yellow spines ; *spinosissima*, var. *brunea*, with similar white spines ; *pyramidalis* and *flavispina* with yellow ; and *M. fuscata*, with grey spines, are the best. Of the short globular set, *M. dolichocentra*, *Nickolsonii*, *mutabilis*, *bicolor*, and *rutila* are useful, while of dwarf much branched plants, *M. stellaris*, *elongata*, *stellata*, var. *aurata*, *pulchella*, *densa*, *tenuis*, and *elongata* make pretty plants. The flowers of this genus are borne from near the apex of the stem, and are often bright coloured. Melocactus is characterised by a thick, short, Echinocactus-like stem, but the flowers are produced in a large cup-like head, which continues to increase in size for many years. The Turk's Cap Cactus (*Melocactus communis*), a West Indian plant, makes a large head of red flowers, shaped like a Turk's cap, hence its name. It is the best representative of the few cultivated species.

Opuntia is known by its many-jointed stems, the portions between the joints being flat and wide, or in a few instances cylindrical. The flowers are produced from the edges of the stems. The fruit is pear-

shaped, and in some species edible, known as Indian figs and prickly pears. A very large number of species are grown, some of the most distinct being *O. arborescens*, *aurantiaca*, *candelabriformis*, *cylindrica*, *decumana*, *ferox*, *Ficus-indica*, *glaucophylla*, *grandis*, *leucotricha*, *nigricans*, and *Dillenii*.

Pereskia is a climbing genus, very distinct by reason of its leafy stems and terminal panicles of flowers. *P. aculeata* and *P. Bleo* are the best known. They are often used as stocks for Epiphyllums, either as standards or trained on a roof with tufts of Epiphyllum inserted here and there. For a small house they are not serviceable plants, being very strong growers.

Phyllocactus.—A group of showy-flowered plants, having flattened jointed stems, from the edges of which the flowers are borne. The flowers are usually brilliantly coloured, six to eight inches across, with long, thin tubes. A mixture of loam, peat, and rotten manure, with plenty of sand, makes a suitable compost, and during the growing season a warm moist house is to be recommended. The plants should be kept on the dry side in winter, but not thoroughly dried off. A number of species are in cultivation, among the best being *P. biformis*, *crenatus*, *grandis*, *latifrons*, and *phyllanthoides*. A large number of garden hybrids are in cultivation, exhibiting a very wide range of colour.

Rhipsalis.—This family has round thin stems, or flattened Phyllocactus-like stems, small inconspicuous flowers, and mistletoe-like fruit, which is the chief attraction. *R. Cassytha*, with numerous white berries, is one of the best. It makes a handsome basket plant, and should be grown like an Epiphyllum.

The following Cacti may be grown in a warm sunny place out of doors, with a covering of mats in frosty weather:—*Cereus viridiflorus*, *Echinocactus Simpsoni*, *Simpsoni* var *minor*, and *Mamillaria vivipara*.

CLEMATIS OVER GARDEN ARCH.

HARDY CLIMBING PLANTS

MANY of the prettiest pictures in the garden are those in which climbing plants play a large part. The Rose, of course, is queen of climbers, but as useful in their way are the Clematises, Honeysuckles, Jasmines, Vines, Wistarias, and others.

Ampelopsis. *See* Vitis.

Aristolochia Sipho, commonly known as the Dutchman's Pipe from the shape of its drooping yellow-brown flowers with their up-turned ends, though not conspicuous for its blossoms, is a handsome plant, soon covering a wall with its large heart-shaped leaves. It is a deciduous climber, and may be propagated by seed.

Azara microphylla is not very hardy, but sufficiently so for southern counties. Its glossy green leaves, hiding wiry spreading stems, are very handsome.

Berberidopsis corallina (*The Coral Barberry*), from Chili, is a pretty evergreen for planting against a wall, but it is rather tender and apt to suffer from frost unless slight protection can be given. Planted in well-drained loam, its glossy green, prickly leaves are not only distinct but ornamental, and its numerous drooping, coral-red, Berberis-like flowers, borne in the axils of the leaves, remain attractive for a considerable part of the summer. It delights in a somewhat shady position.

Bignonia capreolata is a free grower and climber introduced from America nearly two hundred years ago, and hardy only in sheltered quarters. For training against a warm wall, or for clothing rafters in unheated greenhouses it is well adapted, and in such positions its orange-coloured trumpet-shaped flowers are seen to perfection. It should be planted in rich soil, and as it delights in copious supplies of water in the early part of the growing season, efficient drainage should be provided to carry off superfluous water, and thus help to keep the roots healthy and the soil from getting sour.

Calystegia pubescens fl. pl. is usually called a Convolvulus, and is now grouped with that family. It does not grow tall, but is pretty for pergolas, arbours, and screens.

Celastrus articulatus is a free-growing Japanese twiner, and conspicuous for its brightly-coloured berries in winter; they are displayed upon the leafless branches in great profusion. Excellent for clothing arbours, tree stumps, verandahs, &c. *C. scandens* (Staff Vine) is another rapid-growing climber, and a distinct autumn and winter shrub. It loves a cool soil.

Chimonanthus fragrans.—This is hardly a climbing plant; it is more one of those deciduous shrubby things that one puts against a wall for the sake of its flowers or leaves. The Chimonanthus is called the "winter sweet" because of the sweet spicy perfume of its flowers in winter; their lemon-yellow colour is very quiet, but their fragrance is perceptible for many yards away. The way to increase it is by cuttings, seed, suckers, and layers. Suckers become established with moderate rapidity when detached with a few roots from the parent plant. When layering choose the strong shoots from the base of the plant; they should be put down in autumn or after flowering. Cut each shoot halfway through on the underside, pegging it firmly in the soil, and keeping the cut part open. Cover over with soil and leave the layers for a year. Layering is the method of propagation we advise. The shrub must be carefully pruned. Cut the shoots back in spring to within about four inches of the main branches. Upon the new growths from these shoots the flowers appear. *Grandiflorus* has larger flowers than the type.

Clematis.—In almost every garden there is a Clematis, as a rule the rich, purple-flowered *C. Jackmani*. The majority of the Clematises are quite hardy, and the best known are

Clematis balearica, which bears yellowish white flowers, spotted with purple in the interior, about two inches in diameter. In the south of England it often commences to flower as early as January. *C. coccinea* bears scarlet, bell-shaped flowers. Several hybrids of this Clematis have lately been raised which are valuable for the greenhouse. *C. Flammula* (the Virgin's Bower), perhaps the commonest of the family—with the exception of *C. Vitalba*, the Traveller's Joy or Old Man's Beard, which grows wild in our hedgerows—bears small, white, scented flowers in great profusion during the month of August, and is useful for covering trellises, archways, and arbours. *C. florida.*—The type of this species bears large white flowers. Several varieties have, however, been raised by nurserymen bearing both single and double flowers of different tints, among the best of these being Duchess of Edinburgh, double, white; John Gould Veitch, double, lavender-blue; and Lucy Lemoine, double, white. *C. graveolens* is a yellow-flowered species from China, bears its flowers in July, and is a very rapid climber, the flowers being followed by feathery seed-vessels. *C. Jackmani*, a hybrid, is well known by its large, purple flowers, and is grown in almost every town and village in England. Some of the best varieties of this Clematis are the type, *Jackmani alba*, white; Gipsy Queen, velvety-purple; *rubro violacea*, maroon; and *velutina purpurea*, blackish mulberry. *C. lanuginosa* bears the largest flowers of any Clematis, some of these exceeding seven inches in diameter. Anderson Henryi is the best white; while Otto Frœbel, pale lavender-white; Fairy Queen, flesh-colour with pink stripe; La France, violet-purple; and the two doubles, Venus Victrix, lavender; and Enchantress, white, are also beautiful flowers. *C. montana.*—This is a very charming kind. It flowers in May and June, and bears an abundance of ivory-white blooms two inches in diameter. It is very vigorous in growth, and admirably

adapted for rambling over old trees and evergreens. *C. paniculata* is very similar to *C. Flammula*, but flowers a month earlier. *C. patens* bears large white flowers. Good varieties of this Clematis are: Duke of Edinburgh, violet-purple; Fair Rosamond, white; Mrs. Crawshay, pale pink with bronze stripe; and Stella, pale violet. Of the large-flowered Clematises the Patens group is the earliest to bloom, commencing in May. They flower from the old wood.

The only pruning they require is the cutting away of dead wood. The Florida group commences flowering a fortnight or so later. The plants require the same treatment as the Patens varieties as regards pruning. The Lanuginosa group begins to bloom in June and flowers on short summer shoots. Moderate autumnal pruning is requisite. The Jackmani group is the last to flower, blooming from July to October. The plants flower on the new wood and should be cut down to within twelve inches of the ground during the winter.

Clematises Dying Off.—It is perplexing and disappointing to find Clematises dying off without any special reason. Mr. Jackman, the well-known raiser of Clematises at Woking, in a lecture given some time ago, makes some useful observations as follows:—

"There is no doubt that frost is the cause of some deaths, and too much water and bad drainage others, but I cannot agree that either of these is the sole cause of all the losses. My experience is that the plants mostly succumb during the summer months when the ground is driest and the sun has most power, and in the majority of these cases I could not detect any sign of the plants having had too much nourishment or water, or that the drainage was bad. . . . Grafting also cannot be put down as the direct reason, as plants on their own roots go off in the same manner.

"I do not think, however, that *C. Vitalba*, which is so generally used as a stock, is entirely suitable for some of the large-flowering hybrids. The roots differ from those of the latter, being of a hard, wiry character, the hybrids appearing, after they have had sufficient time to get established on their own roots, to ignore the stock, which eventually decays. . . .

"I am of the opinion that it is mainly due to loss of constitution through over-propagation, which has been brought about by the great popularity of, and consequent demand for, the hybrids, and, being of a soft, succulent nature, have responded only too freely to the treatment. My other reasons for coming to that conclusion are, as already mentioned, that the plants mostly go off on the hot, bright days of summer, and in many cases after having made several feet of growth, and are forming the flower-buds, which seems to me to imply that they are wanting in vital power, and are unable to withstand the extra call upon their strength and the extreme heat. If it is not loss of constitution, why was the 'dying off' not noticed twenty-five years ago, and why has it increased of recent years, not only in this country but on the Continent, and how is it we do not see the rampant, robust growths of former years? Again, it seems strange that whilst the large hybrids have been so badly affected, I have never seen *C. montana*, *C. Flammula*,

C. Viticella, or *C. Vitalba* collapse in the same manner, unless my contention is correct that over-propagation is the cause. I might also mention that I have not yet seen signs of the dying off amongst the new hybrids from *C. coccinea*.

"As a decorative plant the Clematis is almost unequalled. Few climbers can surpass it for covering a wall or porch of a house, or training over trellis work, commencing with *C. montana* early in May, and followed throughout the summer and autumn by the large hybrids of the Patens, Florida, Lanuginosa, Viticella, and Jackmani types. To these must be now added the new Coccinea hybrids, C. Countess of Onslow, C. Duchess of Albany, C. Duchess of York, C. Grace Darling, and C. Sir Trevor Lawrence, which, with those of the last type, remain in bloom till frost comes.

"The Clematis is also at home planted out or grown in pots, in the conservatory, cool greenhouse, or glass corridor, if the situation is not too shady or confined. Those of the Patens or Florida types are often more appreciated in these positions than when grown out of doors, coming into bloom as they do at a time when flowers are somewhat scarce, through escaping the May frosts which sometimes spoil those growing outside. Rambling up pillars and poles, over rootery or rockwork, they are alike elegant, and when bedded out produce a most gorgeous effect; but when this is done it is desirable that those of the Viticella and Jackmani types should be selected on account of their profuse blooming properties. Some of the smaller-flowered species, such as *C. Flammula*, *C. graveolens*, *C. montana*, *C. Vitalba*, or *C. Viticella* are also quite in keeping with wild scenery when scrambling over ruins, arbours, tree stumps, banks, hedges, and bushes, whilst several of the herbaceous and sub-shrubby species and varieties are worthy of a place in any herbaceous or mixed border."

Hedera.—This is the well-known Ivy. Few hardy climbers or creepers offer such a diversity in leaf formation and pleasing colours as Ivies. Beginning with the silver-leaved sorts, *Marginata elegantissima* should be made note of. Hardy, free in growth, its light green leaves flushed with white are margined with cream white. *Crippsii* is one of the showiest of the group, as it is of excellent growth, and has handsome silvery grey leaves and prominent veins. The silvered leaves of *Marginata rubra* change to lovely shades of red in winter. *Maderiensis* is rather tender, and should only be planted in sheltered spots. Its leaves are broad and beautifully variegated with silver. There are not many good yellow-leaved varieties, but *chrysomela* is always satisfactory, provided it is not planted in too much shade. Its leaves vary from greenish yellow to rich yellow. *Spectabilis aurea* is also a fine yellow-leaved variety, and *Angularis aurea* is far too seldom seen in gardens. It is neat in habit and very showy.

Green-leaved Kinds.—*Dentata* has larger leaves than any other Ivy, is of free growth, and very handsome; *nigra*, better known perhaps as *atropurpurea*, is a beautiful variety for winter effect. It is of quick growth, and its bright green leaves change to blackish crimson in winter. It is one of the best of the green-leaved Ivies. When the

ONE OF THE RARER CLEMATISES—C. PANICULATA.

winter Jasmine can get its trails of yellow flowers amongst this Ivy, the effect is very charming. *Amurensis*, known also as *macrodonta*, is a quick-growing kind with large, thick V-shaped leaves, deep green in spring, passing to bronzy brown in winter. Emerald Green is a splendid variety for edging walks, as it is of close, compact habit, with rich glossy green leaves. The Bird's-foot Ivy (*H. pedata*) is so named on account of its leaves resembling the feet of a bird. They are light green, with conspicuous silvery veins; *taurica*, *himalaica*, and *angularis* are good sorts too.

Ivies, Tree.—These make excellent plants in pots for decorating rooms, &c., and for winter bedding they are splendidly adapted. *H. arborea* is the well-known Tree Ivy, and needs nothing more than passing reference. The golden-leaved variety—*aurea*—is constant in colour and of free growth. The silver-leaved form and the yellow-berried variety well deserve notice. We enjoy a group of the Tree Ivy with China Roses planted amongst it.

Jasmines.—Three species of Jasmine prove good climbing plants in England. The sweet-scented Jasmine (*Jasminum officinale*) that perfumes the air with its white flowers around cottage porches, its variety *affine*, the yellow-flowered *J. revolutum*, an evergreen, which, being a native of India, was formerly treated as a hothouse plant, but has proved hardy, and the winter-flowering *J. nudiflorum*, which bears sweetly-scented yellow flowers along its leafless shoots in winter. Shoots with buds about to open, placed in water in the house, expand delightfully. It will grow anywhere, even in a London garden; it is one of the brightest and most welcome of climbing plants, and should have a background of ivy or evergreens. Jasmines, besides being placed against walls, may be allowed to ramble over old tree stumps, arbours, pergolas, or planted in groups, say of threes, against rough, stout stakes put into the ground triangular fashion, several feet from each other, and the tops secured with twine. The effect of this at flowering time is very pretty. *J. fruiticans*, from Southern Europe, is a neat evergreen species, and quite happy on a shady lawn. Its yellow flowers are succeeded by round black berries. With regard to the pruning or thinning out of the growths of Jasmines they must not all be pruned at the same time. Shorten the growths of the winter-flowering Jasmine and remove weakly ones.

Lathyrus latifolius (*The Everlasting Pea*), and its white variety, form fine subjects for covering a fence eight feet or so in height. They may be increased by division of the root and by seed, but root division is best. It is a pity that these strong growing perennials are not more grown. The white variety *Alba* is very useful for cutting, and should be grown in the reserve garden for this purpose. There is a variety of the Everlasting Pea named *splendens*, which is very rich in colour. The *L. rotundifolius*, the Persian perennial Pea, has rose flowers, and is a good garden plant. Valuable, too, is *L. Sibthorpi*, which has reddish-purple flowers; it flowers quite early, sometimes in early May. The plant is not so strong in growth as *L. latifolius* and its forms, but in good soil will reach a height of three feet. *L. grandifolius* has large, showy,

rose-purple flowers in pairs, and is one of the most important of the family.

Loniceras (*Honeysuckles*).—The Honeysuckle is too familiar to describe. Its pretty slender growths and fragrant flowers are the glory of many an English hedgerow. There are climbers and bush kinds, the latter being useful for the border and the climbers for draping walls, tree stumps, pergolas, and similar erections. Of the border kinds, *L. Tormentella*, a fairly well-known kind, is valuable principally for its late flowering, its small pink flowers appearing in pairs generally in July. *L. fragrantissima* is one of the few hardy shrubs to flower in winter out of doors. As a wall shrub it is very satisfactory, as it is free in flower and growth too, and although its white flowers are small they are deliciously scented. *L. Standishi* is another winter-flowering Honeysuckle, with delightfully fragrant flowers. Where sweet-scented winter-flowering shrubs are required planters will do well to remember these two Honeysuckles. *L. Alberti*, a dwarf kind, is very rare, and from the middle of June to the middle of July displays its dainty rose-coloured flowers. *L. involucrata*, known also as *L. Ledebourii*, bears yellowish red flowers freely in June. *L. tatarica* forms a dense bush, six feet or so high, and in May and June is very pretty with its wealth of rose-coloured flowers.

Of climbing sorts the evergreen Trumpet Honeysuckles (*Lonicera sempervirens vars*) are rampant in growth and have showy flowers during summer. Those of the type are scarlet outside and yellow in the tube. *Plantierensis* is a remarkably fine hybrid, with larger flowers than those of the last-named. The colour is bright orange and scarlet. Where variety is wanted, *Brownii* and *superbum* may be added. The Trumpet Honeysuckles should be planted in a sheltered part of the garden.

L. japonica aurea reticulata (syn. *L. brachypoda aurea reticulata*) is a sun-loving climber. Its small green leaves are heavily netted with rich yellow. The variety named *flexuosa* bears sweet-scented pink and yellow flowers abundantly, and *L. etrusca*, a European vigorous species, is very free, the flowers orange yellow. *L. flava* is another strong grower, but it is only a success in warm situations. Honeysuckles may be propagated by cuttings inserted in sandy soil in a sheltered position outdoors in October.

Lycium europæum (*European Box Tree*) is a well-known cottage garden plant of free growth, even on poor soils. Its long spiny shoots, clothed with small light-green leaves, carry many small reddish-coloured flowers, which are succeeded by small berries. Suitable for clothing dry banks. *L. barbarum* is a beautiful seaside shrub, slender in growth, with violet-coloured flowers and orange-scarlet berries. Of the last-named, there is a form with pretty silvery foliage.

Passiflora (*Passion-Flower*).—The blue Passion-Flower and its white variety, Constance Elliot, are most effective climbers for covering a large space in a short time, and are practically evergreen, only losing their foliage while the young leaves are starting in the spring. During the whole summer they are covered with their large, starry flowers, and

WISTARIA SINENSIS.

in the autumn are thickly hung with golden fruit in sheltered sites. Propagated by cuttings inserted in cold frame in summer. Prune Passion-flowers in February by shortening to about one-third the strong shoots, but remove weakly growths.

Polygonum baldschuanicum.—This is an uncommon climbing plant of rare beauty. We have read disparaging paragraphs concerning it, but the plant's failure occasionally to come up to expectations is due probably to many seedlings having been raised, and these are not always true to the original type. It has one merit, that of flowering in the autumn. Planted against a pergola, pillar, or stout post, it quickly makes growth, and in autumn the stems are clothed with misty masses of pink-tinted flowers. Sometimes it gets cut down to the ground in winter, but springs up again the following spring. The flowers last well when gathered for the house. It bears some resemblance to *P. molle*, but is quite distinct.

Solanum jasminoides is a beautiful climbing plant that is covered with white flower-clusters through the whole of the summer and autumn. It is not strictly hardy, but does well in the south of England, and has withstood the winter as far north as Derbyshire.

Tropæolum speciosum (*The Flame Nasturtium*).—This is an exceptionally brilliant flowering climber, which dies down each winter. It succeeds better in the north than in the southern counties; and, where it is established, affords a marvellous display of colour, draping the boughs of evergreens with its scarlet flower-trails. Propagated by division of roots. It loves to run through shrub growth. It may be frequently seen in the Highlands of Scotland covering the cottages with a crimson dress of flowers.

Vitis.—For beauty of leafage the Vines excel all our deciduous climbers. They may be used for covering pergolas, arbours, trellised walks, or for garlanding the trunks of old trees. There are many ornamental species, of which the following form a good selection:—*Vitis Coignetiæ*, a recent introduction, which bears leaves, often one foot across, that assume a rich bronzy crimson in the autumn. *V. californica*, *V. Labrusca*, *V. Romaneti*, and *V. vinifera purpurea*, all of which are characterised by rich autumnal tinting. *V. laciniosa* bears very deeply-cut leaves, while *V. heterophylla humulifolia*, the Turquoise-berried Vine, in addition to its handsome foliage, has the further merit of producing a profusion of pale-blue fruit. The Japanese Vines are glorious climbing plants; their big leaves are a blaze of colour in autumn, and every one knows how graceful the Vine is—beautiful, not merely for its foliage and tendrils, but for its fruit-clusters too. The Virginian Creepers, formerly known as Ampelopsis, are now included in the Vitis family, the common Virginian Creeper being entitled *V. quinquefolia*, while the clinging *Ampelopsis Veitchi*, so largely used for covering house-walls, is named *V. inconstans*. *Ampelopsis*, or *muralis*, is a very beautiful form, which does not cling so closely as *Veitchi*, and turns to brilliant autumn colours.

Wistaria sinensis, with its long tassels of scented, lavender flowers, is one of the choicest of our spring-blooming climbers, and is

equally adapted to covering walls, arches, and pergolas. There is a white variety and also a double form of this charming plant, but the type is the most beautiful. *W. multijuga* is a species much grown in Japan; it produces extremely long flower-racemes, but in this country it is far inferior to *W. sinensis*. Wistarias may be propagated by layering the young shoots in the summer. When well-established the plants make rapid growth, but cases often occur where they fail to make vigorous shoots for some years, in which event their roots should be exposed and afforded a dressing of rich soil. Prune by shortening back the shoots in the early year.

PLANTS FOR EDGING

THE WAY TO AVOID HARD EDGINGS OF TILE, WOOD, AND SLATE

A hard, cold-looking edging will spoil the prettiest garden. Tile, which frequently splits in winter, slates, and wood are abominations, wood perhaps the least objectionable of all, but this breeds fungi, and looks unpleasantly formal. Soft stone, or stone from the district, makes, with plants planted between or at the sides, a delightful edging. The plants, Cerastium, Aubrietia, Gentianella, Saxifrage, Stonecrop, House-leek, or whatever may be used, cover the stone in time with their cushion-like growth. One of the prettiest edgings is that composed of the ordinary white Pink and Mrs. Sinkins, or any other variety. I also admire the fringed Pink of the cottage garden. In a description of a well-kept garden, where the Pink was used as an edging, the writer says: "On entering the garden one is struck by its neatness and order. What was taken at first glance as well-kept Cerastium proved to be nothing but the common white Pink. As a bordering I never remember having seen anything more pleasing or neat, and it certainly looked better than the sombre Box or formal red tiles." One thoroughly enjoys the perfumed flowers in early summer, and the silvery tufted growth at all times. The Pink is as charming in winter as it is in summer. Spring is the time to form a Pink edging. Plant the tufts thinly, sufficiently deep to bury the stems, and then make the soil firm about them.

Thrift or Sea Pink (*Armeria vulgaris*) is another pretty edging, the time for planting which is the spring; and the following is a list of other things suitable for this purpose:—

Arabis.

Aubrietias.—The purple colouring of the Aubrietia flowers is very rich in spring. We enjoy masses of growth rambling even on to the walk.

WHITE PINKS WITH EREMURUS HIMALAICUS.

Alyssum.—*A. saxatile*, the yellow flower of spring so frequently seen in rock-gardens and in the borders, is very useful as an edging of the rougher kind.

Daisies.—The double crimson in particular, but the Daisy enjoys a cool soil and is not always satisfactory as a permanent edging.

Gentianella.—This must be planted in a prepared moist soil, loam for preference. It is not happy everywhere, but where it succeeds forms a perfect mat of growth. When it becomes flowerless, replant it. Mr. Wilson has yards of edging of it in his beautiful wood garden at Wisley. *Gentiana acaulis* is its botanical name. It may also be planted between the soft stone where this is used.

Saxifrages.—The London Pride (*Saxifraga umbrosum*) is a well-known plant for edging; its slender stems of pinky flowers are very pretty and "misty." Where stone forms the foundation of the edging, make free use of Stonecrops, not forgetting the common *Sedum acre*, and its yellow variety *aureum;* the shoots are tipped with yellow in early spring days.

We do not object to a good stone edge of rather hard stone set on edge; it is neat and warmer in look than tiles, especially of some patent make. Grass edgings look well, but are a source of endless labour to keep neat, and an unkempt grass edge is an eyesore. Frequent mowing and clipping at the side are essential to keep this form of margin respectable. Ivy of a good green-leaved form, say Emerald Green, or the Irish Ivy, are useful where a rather tall edging is desired. It is useful to form an edging to a shrub group or large run of walks. It must not be overdone, otherwise the garden will appear dull and heavy. Box, of course, is one of the good shrubby things found in many old English gardens. But it must be cared for by frequent clipping, and spring is the time to repair deficiencies. There is one objection to Box as an edging, and that is, it harbours slugs and other pests.

BULBOUS FLOWERS

HARDY bulbous flowers are a sheet-anchor for the beginner, who need merely plant the bulbs in the autumn, and await results. Their fresh beauty and cheapness should make them more popular than they are even in these days of general gardening, and those with greater opportunities of painting beautiful pictures than are provided by the mixed border or the ordinary flower-bed, may enjoy the Daffodils and other early flowers in meadow, in shrubbery margin, and beneath trees in the orchard. It is only in recent years that we have learnt how beautiful many of the hardy flowers are, and especially those that have bulbous roots, when planted out in grassy and other half-wild places. The nature lessons that lay before us in meadow and woodland were long unheeded, and yet they were patiently awaiting for just appreciation. The Fritillaries and Daffodils of our strong-soiled meadows, the blue Hyacinths and purple Orchis of our woodlands, the Snowflakes of the river banks, these and others in our own land, and to travellers the Poet's Narcissus of the Alpine meadow, the sheets of other Daffodils in Pyrenean mountain valleys, the Crocuses and Cyclamens of southern Italy, and many another foreign bulb familiar only in our gardens, were all waiting to teach us a lesson. All these good plants, though known to us for garden use, had never been utilised to the full of their ornamental capacity until we were taught to have them in bold plantings outside the garden proper, in wider spaces, where they not only could show a much larger measure of beauty, but were safe from the continual disturbance that bulbs must suffer when grown in close association with other plants.

It is only now, since we have learnt to plant our bulbs boldly in such ways, that we can see the full beauty of their effect in the mass, and can enjoy the pictorial aspects of the flower-enriched landscape.

Of all bulbous plants the Daffodils must rank the highest in their willingness to enliven wood and meadow-land. Not only do they show at their best when so grown, but such treatment also suits them admirably, for many kinds that are tender or unsatisfactory in gardens will grow willingly in the

DAFFODILS AMONGST OLD TREE ROOTS.

A COLONY OF COLCHICUMS.

sheltering grass of field or copse, and make but slow and steady increase, that seems to tend to more healthy reproduction than the unnatural stimulation of manured garden ground.

When one thinks of the great range of choice, of the many kinds of Daffodils, of Snowdrops, of Scillas and their allies, of Iris and Dog's Tooth Violet, of the early winter Aconite, and the autumn Cyclamen, Crocus, and Colchicum; of the strong and stately Crown Imperials and Tulips of spring, and the dainty Acis of latest autumn; of Lilies, many of them doing best in the wild; when one thinks of all these, and many others, one becomes aware that there is no lack of material, but that it is only apathy in its utilisation that leaves many a rough space in the garden outskirts bare and featureless when they might be gladdening us with smiling pictures of floral beauty.

SOME PLACES TO PUT BULBS

The following hints may be useful to beginners. Sometimes there occurs in a garden a low bank or bed of hardy Ferns. The spaces between these offer excellent places for bulbs, such as the smaller Scillas, Chionodoxas, and Puschkinias. This is well worth noting in preparing a Fern garden —a kind of garden that seems to have fallen into disuse, but is capable of being made extremely beautiful, though not by planting the Ferns among heaped-up stumps, as was formerly so often done. When the little bulbs are blooming the Ferns are not yet thinking about unfolding their fronds, but after the bloom is over and the foliage has grown full and tall as it begins to turn colour after completing its life-work, the Fern fronds are unfurling and spreading over the ground. To avoid the monotony that might be felt if the space showed nothing but flowering bulbs and brown tufts of undeveloped Fern, it would be well to introduce just a few early flowering plants such as Dentaria, Woodruff, Virginian Cowslip, and the pretty feathery *Myrrhis odorata*. Among the bulbs, first there are the splendid blues of the Chionodoxas and early Scillas, then there is a range of colourings that must be kept apart from these, and will do well amongst themselves or near neighbours. These will comprise the old garden Dog's Tooth Violet and its varieties, and an old cottage garden plant that is not showy, but is full of a certain quiet modest charm, namely, the purple Fumitory (*Corydalis bulbosa*). These should be intergrouped as they form a quite delightful

colour harmony. Following these, and keeping within the same colouring, will be the purple Fritillary, and some of the white variety, and this white kind will also be near a good planting of the beautiful *Scilla italica alba*, a plant not common in gardens. Further back will be patches of the tall Snowflake (*Leucojum æstivum*) while its earlier relative *L. vernum* will be in connection with the patch, or rather long straggle, of *Scilla sibirica*. Winter Aconites and Snowdrops are too early for this bit of garden, so their homes are elsewhere; and as the space is somewhat shaded, possibly neither the brilliancy of *Anemone fulgens* nor the splendour of *Iris reticulata* can be depended on, but this condition will make it all the better for *Anemone apennina* and the best of the Wood Anemones.

The Ferns will be few in number of kinds, and these will be nothing out of the common—the Male Fern, Lady Fern, Dilated Shield Fern, Hart's Tongue, and Polypody, perhaps these and no others. Plant mostly in long drifts and sink a few large stones in the earth, partly for appearance' sake and partly for comforting coolness and moisture to the roots of the Ferns; let there also be some tufts of *Iris fœtidissima*, a plant whose dark-green sword-shaped leaves would make a distinct contrast to the feathery light-green fern-frond masses.

The following are amongst the most important bulbs for the garden:—

Bulbocodium vernum.—An early spring-flowering bulb, bearing rosy purple flowers about four inches long, and growing to a height of six inches. This is one of the earliest plants of the year, and for that reason should be planted in the rock-garden in some warm, sunny spot, where we may enjoy its fresh, welcome beauty in comfort. It is a native of the European Alps, may be increased in July by separating the bulbs, and requires to be put about two inches deep. It is not a bulb for quite a beginner, unless a collection is wished for.

The Calochorti.—The Californian Tulips or Mariposa Lilies are a charming group of bulbs, not exactly for quite the beginner with a very small garden, but for those who have a sunny border, as Calochorti revel in warmth. In their native country of California they are found plentifully in some districts, but usually the various species are found growing by themselves. Although the writer has never seen the Californian Tulips growing wild, travellers have told him of the glorious picture created by the flowers, sheets of butterflies dangling on the slender stems, spotted and dabbed with colour. The bulbs must not be dotted about the borders; they must be planted in masses, and it is wise to devote a small part of the garden to them, as then their requirements are easily supplied. The dwarf-growing species, the Cyclobothras and Star Tulips are best in little corners and ledges facing south in the rock-garden. Among these, *C. Purdyi*, white and quite downy from its

AUTUMN CROCUSES IN THE GRASS

covering of soft hairs, is the best. Plenty of sun and a south aspect is considered suitable for them, but Mr. Wallace of Colchester writes me: "I rather fancy that shade from the hot midday sun in summer is beneficial, and a soil that does not become too hot and dry is preferable. A little good friable loam worked in with the light soil will be found of assistance, and one must not forget that good drainage is also essential. Growing the bulbs in a cold frame, with a raised light over them to admit air and throw off the rain, is perhaps the simplest and most effective method of cultivation. Some of the finest flowers I have ever seen were in the gardens of the Rev. H. Ewbank, St. John's, and Captain Daubuz, Buckingham Villa, both in Ryde, Isle of Wight, during last summer. They were grand, quite three feet high. Flowers of Pictus, Vesta, Citrinus, &c., two inches to three inches across, and as many as eighteen flowers from a bulb, *C. clavatus*, I saw at Hayes growing in a border outside a greenhouse, a small clump about three feet high, and, counting both flowers and buds, there must have been almost a hundred—it was a particularly fine sight. Now that the bulk of the *Venustus* variety are so cheap, and where a quantity of cut flowers are required, many people want these extensively, growing them in frames; if cut when just opening they last a long time in water. The following is a selection comprising most of the finest and best:—*Pulchellus* and *amœnus*, *Benthami*, and *Purdyi*, of the dwarf-growing kinds. Amongst the true Mariposa Lilies, *C. clavatus*, *splendens*, *Lyoni*, *venustus*, *citrinus*, *vesta robustus*, and the Eldorada strain are to be recommended. I would advise those who have not at present attempted the culture of this beautiful family to procure some of the above kinds and make a start, bearing in mind, however, that it is far better to devote a *small corner* to them than to have them scattered throughout the garden. The best time for planting is from the middle of October to the middle of November, and put the bulbs three inches deep."

Camassia (*The Quamash*).—Handsome North American plants, producing flower-spikes three feet in height. *C. esculenta*, purple, and *C. Leitchlini*, white, are ornamental; the former is the Quamash. We should, however, choose Daffodils, Tulips, and commoner bulbs before the Camassias. Plant in the autumn, and if there is a meadow or orchard garden the Camassias are pretty there.

Chionodoxa. — Charming plants bearing many-flowered bloom-spikes of deep blue in early spring. *C. sardensis*, deep blue, is the most striking in colour, but *C. Luciliæ*, which bears larger flowers of a lighter tint, is still more largely grown. *C. Alleni* and *C. grandiflora* are improved forms of the latter. The popular name for the Chionodoxa is Glory of the Snow. *C. Luciliæ*, in particular, is a delightful bulb, quite easily grown, and may be scattered about the rock-garden, in the border, and is pretty in pots in the greenhouse. In some light soils the Glory of the Snow increases rapidly. We enjoy the fresh blue and white flowers of this plant. *C. grandiflora*, or *gigantea*, as it is also called, has larger flowers of a more self shade. Plant in the autumn, and put the bulbs two inches deep.

Colchicum (*Meadow Saffron or Autumn Crocus*).—This is a charm-

ing family. The best known is *C. autumnale*, which produces its rosy-purple flowers in September and October. There are several varieties, bearing flowers of different hues, and they form a pretty picture when naturalised in the grass or at the edge of a shrubbery. It is always well to plant such bulbs as these, which flower late in the year, with a groundwork of mossy Saxifrage, Stonecrop, Herniaria, or similar things to protect the blooms when heavy rains dash up the soil and sully their fresh beauty. Plant them in August, putting them about six inches deep. The double white variety is charming; it is like a white rosette. *C. speciosum* is a splendid flower; its rosy-purple, goblet-like flower is on a stem or stalk about a foot high, and stands far out of the ground. *Parkinsoni* is easily known by its purple-chequered flowers. The most beautiful of all Colchicums is the little-known *C. Sibthorpi*. That good gardener, the Rev. Henry Ewbank, says of it: "I cannot understand why it has been so little appreciated in the gardening notices of these things which I have read during the present autumn (1900), and the only explanation I can think of is that it is not much known at present, and being an expensive bulb, it has not as yet come to the front save in a few places. Instead of *C. Sibthorpi* being nearly as large as *C. speciosum*, as it is sometimes said to be, it is in reality a great deal larger. It is of a more attractive colour than its congener, and its globular shape—it seems to sit on the ground like a large cup—sets it off wonderfully. Moreover, it is very strong and floriferous, and grows with such ease that no particular rules for cultivation are required. I regard it as quite one of the best things I have had in my garden for some time, and if it answers as well in other places as it does here, it will be worth any one's while to get hold of it and to give it a good chance." The flowers are richer in colour than those of *C. speciosum*, and with beautiful crimson reticulation. Autumn Crocuses enjoy a cool soil. To increase them lift the bulbs every third year, and replant as soon as the foliage is fully matured. Plant in August.

Crocus.—Besides the common garden Crocus, golden, purple, white, and striped, there are many other attractive species, some blooming in the autumn, some in winter, and others in the spring. The winter-flowering kinds must be grown in a frame, but the others may be planted two inches deep in the open border. *Crocus Imperati*, with purple and buff flowers, is the earliest spring Crocus. There are so many Crocuses that it is impossible to do anything like justice to them in a beginner's work. The ordinary Dutch kinds, the large yellow, purple, white, and other colours, are the showiest, and may be planted as margins or in colonies in the border. Near large towns especially, birds are frequently troublesome, so much so that in London sparrows will peck off the florets wholesale. A few lengths of thick cotton stretched across the rows stop the depredators in a large measure. Poison and traps will thin out mice, which have a strong liking for Crocus bulbs. It is a pity that the beautiful autumn-flowering Crocuses are not more grown. The most beautiful is *C. speciosus*. Mice are fond of it. Plant in the summer, and put the bulbs wherever clouds of purple colouring are desired in autumn; the sun opens out the flowers and discloses the orange

THE SNAKE'S HEAD FRITILLARY (FRITILLARIA MELEAGRIS).

stigmata. The Meadow Saffron (*C. sativus*) spreads freely in warm gardens and its pale lilac flowers are very pretty. *C. iridiflorus*, *C. nudiflorus*, and *C. longiflorus* are handsome autumn flowers. Put Crocus bulbs about two and a half inches deep.

Daffodils. *See* Narcissus.

Fritillaria (*Fritillaries*).—Of these plants *F. imperialis* (the Crown Imperial) is the most striking. It is a stately, spring-blooming plant, growing to a height of four feet, and bearing heads of drooping flowers, clear yellow and orange-red in colour. *F. Meleagris* (Snake's-head), with its purple diapered flowers and its white variety, are charming when naturalised in moist places in the grass. It is amongst the Fritillaries that we find so many of the varying tints of green and others of a bluish glaucous tone, from which they merge to purple and plum. The flowers are usually of quiet beauty. Many of the species are quite easily managed, not only in the border or in the rock-garden, but equally so in tufty ground or in pasture. *F. pallidiflora* is very distinct, and certainly one of the best. The flowers are of a pale yellow tone, and beautifully chequered, whilst the foliage is glaucous in colour. The species comes from Siberia, and is therefore quite hardy. Another species also in flower at this time and a good companion is *F. pyrenaica*, a rather dark plum-coloured flower, heavily netted with dark brown, very hardy, and quite easily grown in sandy soil. Others worthy of note are the scarlet *F. recurva*, *F. citrina*, *F. alpina*, and the beautiful *F. Whittalli*. In the general culture of Fritillaries remember to plant in autumn, and a comparatively dry soil is beneficial. The Snake's-head, however, prefers moisture. Seed sown as soon as ripe in pans of sandy soil will not result in flowering plants under five years. Small bulbous offsets are produced, which should be planted in a reserve bed of porous soil, and soon make good specimens. Plant from four inches to six inches deep.

Galanthus (*Snowdrop*).—The Snowdrop, though grown in every condition of soil and site, flourishes best in a moist and shady situation. *G. plicatus* and *G. Elwesi* are two fine forms. There are many other Snowdrops, but these are quite sufficient for a small garden. The ordinary Snowdrop is pretty too, and all are pleasing in pots. Plant one inch deep.

Galtonia (*Hyacinthus*) **candicans.**—This is a tall, bulbous flower, with a stem quite three feet high. Unlike so many other bulbs from South Africa it needs no special care, such as drying off and replanting, but makes itself quite at home in our gardens, preferring rich and stiff soils. It is a plant so distinct as well as important that it deserves to be placed with special care. Of all positions the best would be as an isolated group, only associated with some rather important foliage of a different character, such as that of the larger form of *Megasea* (*Saxifraga*) *cordifolia*, and so placed that it would be against a background of quiet and yet dark rich greenery, such as that of the clipped yew hedge, where its ivory-white bells, suggesting large Snowdrops, and glaucous leaves would have their fullest value. Propagate by offsets or by seed. Four years elapse before the seedlings bloom. Sow the seed as soon as

ripe in the open ground. Plant in the autumn, and put the bulbs well down, say six inches.

Iris.—The English Iris (*I. xiphioides*) and the Spanish Iris (*I. xiphium*) are the best known of the bulbous section of this family. Both are handsome plants. The English Iris bears white, lavender, deep-blue, purple, maroon, and striped flowers, while in the Spanish the colours are blue, yellow, white, and striped. The striped varieties are far inferior to the self colours for effect. The bronze, purple, and yellow Thunderbolt, belonging to the Spanish section, is an interesting flower. These Irises succeed best in a light, well-drained soil. In heavy, retentive soils they often perish during the winter. Plant the bulbs about four inches deep. *I. reticulata* (the Netted Iris), *I. alata*, and *I. persica* are three dwarf plants flowering in the early spring. It is well to have the rarer bulbous kinds in pots, especially those that flower in quite the early year.

Iris reticulata is an especially sweetly fragrant flower of the early year. There is a variety named *major*, which has larger flowers than the type. A few of the deep purple flowers will scent a large room. A well-known gardener, writing about this bulb, says: "I planted them in large groups in the hardy plant border, which is well drained and faces south. The only attention they receive consists in clearing off the old foliage in autumn, forking off the top soil, and adding some old potting material. In March I counted, on a clump two feet across, sixty to seventy flowers, either open or opening, and many more to follow. The foliage with us attains a height of two feet, and the flowers are strong in proportion. It has often puzzled me why gardeners who need a lot of cut flowers do not grow it, considering the quantity of lovely flowers to be had from good plants." Occasionally the bulbs are attacked by a fungus, which may be brought into the garden from stock affected with it. When this Iris has established itself in a garden, it is wise to ascertain the condition of any fresh bulbs introduced, and the place from whence they came.

Leucojum (*Snowflake*).—Graceful plants, bearing drooping, white bells. *L. vernum* blooms in the spring and grows to a height of three inches. *L. æstivum* flowers later and often exceeds two feet in height. It is excellent for naturalising in the wild garden or in the grass by water.

Lilies.—Of the numerous Lilies many will be found to flower well in ordinary garden soil. The following form a good selection:—Bulbiferum, two feet, orange-red; Candidum (the Madonna Lily), five feet, white; Chalcedonicum (Scarlet Turk's Cap), three feet; Croceum, six feet, orange; Davuricum, two feet, orange-red, black-spotted; Excelsum or Testaceum, five feet, buff; Giganteum, ten feet, ivory white; Henryi, six feet, orange-yellow; Humboldti, five feet, apricot, spotted-maroon; Martagon, three to five feet, white, purple, and purple-black; Pyrenaicum, three feet, yellow, spotted-black, red anthers; Szovitzianum, five feet, pale yellow, sometimes dotted with minute black spots; Thunbergianum, eighteen inches, yellow to red, sometimes spotted; Tigrinum, four to six feet, orange red, purple-spotted. Lilies should be planted as soon as the flower-stems die down, and

LILIUM SPECIOSUM AS A POT PLANT.

should have four inches of soil above the bulb, which is best surrounded by sand. Of those named in the foregoing list *L. giganteum* requires a deep bed rich in decayed vegetable matter; the others will generally succeed in good, porous garden soil. Lilies should be grown in a sheltered spot, and partial shade is beneficial. In peat the Swamp Lilies, *L. canadense*, *pardalinum*, and *superbum* can be grown. They are exceedingly graceful and brightly coloured. Other handsome Lilies are *L. auratum*, *speciosum*, and *longiflorum*, but, as these have a habit of dying out after the first year or so in many gardens, an annual purchase is often requisite to maintain a display. They should, however, be tried as they sometimes become established. There are many other beautiful Lilies besides the twenty here enumerated, but they are less suited to general cultivation than those already named. In large gardens the bulbs are planted amongst shrubs with excellent effect. The shrubs protect the rising Lily stems in spring from frost, and the association of the two things is quite happy.

It will interest Lily growers to read the remarks made by Mr. Wallace of Colchester, a well-known Lily specialist, in a paper published in the Royal Horticultural Society's Journal for 1900:—"It is difficult to lay down hard and fast rules as to the proper positions to plant Lilies, as the same variety may be seen flourishing equally well under totally different conditions, but I would recommend intending planters to avoid positions exposed to cold sweeping winds. Never plant directly underneath trees, but if possible at some distance away—the trees will then give them the required shade; nor in a hot dry corner, or in a cold, wet, heavy soil, or where the soil is water-logged. If planted near a lake or a large expanse of water, the young growths will need protection from late spring frosts. *L. Henryi*, *auratum*, *longiflorum*, *speciosum*, are specially liable to injury from this cause. In Rhododendron beds and amongst low growing shrubs they always do well, and in no position do they show up so effectively as when backed by the rich deep green leaves of the shrubbery. The beds at Kew near the Palm House are excellent examples of this mode of culture. Therefore in a few words, and at the risk of repeating myself, the best positions for Lilies are those that afford partial shade, protection from spring frosts and hot midday sun, and that give coolness and moisture at the root.

"Having found the right position for Lilies, the next thing is to see that we give them the best and most suitable soil for their requirements. One can generally do this, even if an ideal position is not to be found. The different soils suitable for successful cultivation I have divided roughly into three classes:—

"*First*, any good garden soil of a fair depth, well dug before planting, is suitable for such good growing kinds as *L. Browni*, *candidum*, *chalcedonicum*, *croceum*, *excelsum*, *Hansoni*, *Henryi*, *Martagon* (purple), *pyrenaicum*, *thunbergianum*, *tigrinum*, and *umbellatum*; these will all flourish in any good border soil with fair treatment.

"*Secondly*, Lilies that prefer a strong soil, such as a good rich friable loam, not too heavy, viz. *L. auratum platyphyllum*, *Batemaniæ*, *Columbianum*, *Humboldti*, *Humboldti magnificum*, *Martagon album*, *Dalmaticum*,

Pomponium verum, rubescens, speciosum, Szovitzianum, Washingtonianum, and *Wallichianum superbum.*

"*Thirdly,* we come to those that require peat and moisture, viz. *Burbanki, canadense, Grayi, Pardalinum, Parryi, Philadelphicum, Roezlii superbum.* The above lists represent, in my opinion, those Lilies which can be grown with little trouble. Those in the first list will succeed in any ordinary border under conditions inferior to those already described as essential for perfect cultivation. Those in the second list require a certain amount of partial shade and coolness at the root, and are suitable for planting in Rhododendron beds and amongst low growing shrubs. Finally, the third group comprises those that require a cool, shady spot, such as the edge of a pond or stream, or in a woodland glade. In addition to the species mentioned, there are a great number which are capable of successful cultivation with a little extra care, varieties which to an enthusiast would be indispensable. Having found the right position and soil, the next step is to see about planting the bulbs, and at what time this is best done. On this point great divergence of opinion exists among the general public (I am not now speaking of Lily enthusiasts). In fact, I should say more Lilies are planted in the spring months than in the autumn; whereas it is plain to all those who look into the matter that autumn is the best time to plant most of the species. A Lily when in full growth is performing two functions—one developing, by means of its stem, the flowers, and the other, by means of its basal roots, the bulb for next year's growth—so that it requires as much attention to its wants below the ground as above. All Lilies do not have similar root action; there are two classes. First, those that make two sets of roots, one from the base of the bulb, the other from the bottom of the flower stem. Second, the Lily that only produces roots from the base of the bulbs.

"Now it is obvious which Lily requires early planting and which Lily can be planted late with reasonable hope of success. Those Lilies that have only basal roots to depend upon must be well established before they can flower with any degree of success; as, unless they are well rooted, the stem has nothing to draw from and feed on except the bulb, which naturally suffers. Whereas those that have two root actions may be planted almost at any time, for as soon as the stem is about six inches high, roots may be observed breaking out in small rings round the base of it, which grow with exceeding vigour, and help and support the stem to produce its flowers almost independently of the bulb. I have often noticed when lifting *L. auratum* that those bulbs which had plenty of basal roots had new well-formed bulb growth, whereas, when it was absent, the bulb had flowered by means of the stem roots and then collapsed.

"*Lilium Martagon* and its varieties, *Chalcedonicum, Szovitzianum, Dalmaticum, Humboldti,* and others of a similar character, only produce basal roots. The root action commences about the middle of October or earlier, and continues during the winter. Therefore, if it is necessary to lift the bulbs, it is best to do so before root action takes place, for if the bulb be lifted after root action has commenced, and the roots

THE BUFF-COLOURED LILY (LILIUM TESTACEUM).

damaged or dried, it receives a serious check, and will only produce a weak growth.

"I lift my bulbs early, and keep them cool and moist in cocoa fibre, and plant them again not later than December, when root action at once commences, and not much time is lost. And I think that there is not much doubt that the late planting of Martagon Lilies, and after root action has been checked, is the cause of their partial failure the first season. Good, sound imported bulbs of Japanese Lilies, which now arrive in excellent condition during the early part of the year, may be planted as late as March and April with every confidence as to the result, provided they are in a fresh and sound condition for planting when received.

"As a general rule, when planting bulbs, they should be put in the soil about three times their own depth; the soil should be well dug, and it is beneficial if a little peat, turfy loam, leaf soil, and sea sand be added. This latter (the sea sand) should be placed all round the bulbs; in fact, we use sea sand to a very large extent, generally covering the bulb entirely with it. It is always moist, and being of a gritty nature prevents the attacks of slugs and grubs, and also keeps the soil from setting fast round the bulbs.

"I would recommend, when planting Lilies amongst Rhododendrons and shrubs, the using of old tubs cut in half with the bottoms knocked out. They can be sunk in the beds and filled with a good mixture of soil, and will serve to keep the roots of the shrubs and trees from interfering with the bulbs. Lilies planted in this manner are generally very successful."

Mr. Wallace makes a few remarks about growing Lilies in pots, selecting for this purpose such kinds as *L. auratum* and its varieties, *speciosum* and its varieties, *longiflorum*, *Hansoni*, *excelsum*, *umbellatum*, *candidum*, *Henryi*, and *Wallichianum superbum*:—"The bulbs should be placed in pots about two and a half times their diameter and two inches below the surface of the soil. Good turfy loam, peat, and sand make an excellent compost. Plunge the pots in ashes outside under a wall, or in a cold frame; and as soon as root action has well commenced, take them into the greenhouse as required. When the bulbs are well rooted, care must be exercised in watering; for, as the pots are full of roots, if once they get dry, serious damage is quickly done. Give *auratum* plenty of shade and moisture; the variety *platyphyllum* is a noble pot plant, and very reliable. After flowering they should be plunged outside in a cool, shady border; and when the foliage has quite died down, they should then be stored for the winter in a cool frame or outhouse. In early spring they should be gone over, and fresh soil added and renewed."

The Muscaris, or Grape Hyacinths.—These are charming little plants, producing heads of bright blue, beaded bells in early spring; they are suitable for the rock-garden or sloping bank. The stronger forms may also be naturalised in the grass. *M. atlanticum*, *M. neglectum*, *M. armenaicum*, *M. botryoides*, *M. paradoxum*, *M. præcox*, and *M. racemosum* are beautiful kinds. *M. moschatum*—the Musk Hyacinth—is valuable for its delicious perfume, while *M. comosum monstrosum*—the

Feather Hyacinth—is interesting from its quaint formation. *M. conicum* is one of the best and least known of the family. The rich violet-blue flowers are produced in profusion, and their delicate fragrance is enjoyable. It may be used with advantage to cover the ground in shrubberies and beds where the plants are not too close together. Naturalised in the grass it is quite at home, multiplying freely. The flowers last long in beauty, and are useful for cutting. This useful and easily-grown group is much neglected in English gardens, notwithstanding the fact, that a rough bank may be purpled with their flowers in early spring. Plant Muscari bulbs two inches deep, and for increase separate the bulbs when they are lifted.

Narcissus (*The Daffodil and Pheasant's Eye*).—These surpass all other hardy bulbs in their value for the decoration of the garden. Delicately-fashioned species, such as *N. triandrus*, *N. bulbocodium*, and *N. minimus*, are seen at their best in the rock-garden, while showy kinds brighten the mixed border before the herbaceous plants have spread their foliage, and the most vigorous varieties provide exquisite pictures when naturalised by thousands in the grass. Of the golden Trumpet Daffodils, or Magni-coronati, the following are excellent varieties:—Maximus, Golden Spur, Emperor, *N. obvallaris*, and Queen of Spain. In bicolors, which have golden cups and white perianths, Horsfieldi, Empress, Grandee, and Victoria are good, while of the white Trumpets Madame de Graaf is the best, but this variety is still too expensive for general planting; other good kinds in this section being Albicans, Moschatus, *N. pallidus præcox*, and Princess Ida. Of the double Trumpets none excel the old double Daffodil. In the chalice-cupped, or Medio-coronati section, Sir Watkin, a fine bicolor, is the most vigorous; C. J. Backhouse, a lovely flower, with orange-scarlet cup; *Barri conspicuus*; Mrs. Langtry, white; Goliath, and Madge Matthew are also particularly attractive. The Parvi-coronati group includes the Pheasant's Eye Narcissi, of which *N. poeticus ornatus*, *P. poetarum*, *P. recurvus*, and the double form, are beautiful flowers, as well as the handsome Burbidgei section. The best for general culture of the Polyanthus, or many-flowered, Narcissi are Grand Monarque, Soleil d'Or, and Scilly White. This group is, however, rather more tender than those already alluded to. It is not wise to have too many kinds. The time to plant Daffodils is quite the early autumn, September, or even late August. This may surprise some amateur gardeners, as October and November are still the months sacred to bulb-planting. This, of course, is difficult to remedy, as one cannot, as a rule, receive the bulbs from the dealers before the autumn. Plant the Pheasant's Eye or Poet's Narcissus (*N. poeticus*) first, as this starts into root-growth before the others. It is worth knowing the opinion of the Rev. G. H. Engleheart, who has raised so many beautiful hybrids, as to the depth to plant Narcissus bulbs:—"I think four inches clear, or even five inches or more in the case of the largest bulbs, is none too much soil above their tops. This insures their being well below the unstable top-layer of the soil—*i.e.* that which is subject to contraction and expansion in the frosts and thaws of winter. In my opinion it is the immunity from this move-

DAFFODILS IN THE GRASS.

THE PHEASANT'S EYE NARCISSUS IN BARR'S WATER GARDEN

ment which accounts for the success in turf of some kinds which die out in cultivated ground. The common explanation is, that turf is sweet and free from manure. But if this were all, why is it that beds of the very same turf chopped up and converted into loam will not grow these same kinds? Ard Righ and Henry Irving may be specified as kinds which have been experimented on in my grass and my beds. I am satisfied that a partial explanation at least is that the grass fibres bind the upper soil to the lower, and so prevent this teasing movement in times of alternate frost and sun."

Mr. Engleheart makes some useful remarks also about dividing the bulbs:—"It is, of course, tempting to detach all visible offsets from rare kinds in order to increase one's stock. Some very robust varieties seem to suffer no harm from quite forcible division. I remember that Sir Watkin, when it was still new and valuable, could be almost chopped into pieces. But I am certain that many Narcissi would mount to a larger and healthier stock at the end of, say, six years. if divided only three times—*i.e.* every other year—than if divided annually. A safe rule is the following: If nearly the whole circumference of the base of the offset stands out free from the parent bulb, the offset may be detached and will grow satisfactorily; but if a third or so of the base is incorporated in the substance of the parent, the union should not be destroyed. It is well to divide the bulb only at the moment of planting in order that incipient roots may be at once placed in contact with the moist soil and not exposed to the air. It is questionable whether the universal practice of 'cleaning' bulbs—*i.e.* of removing the old roots—is not more or less hurtful. In the case of kinds such as Maximus, which have strong wiry roots firmly attached, it is not easy to remove them without tearing the basal plate. It is certainly difficult to ensure close contact between the base of the bulb and the soil if a large bunch of stiff roots is left on. But where the variety is valuable it is quite worth while to finger the roots outwards and upwards to allow of this contact, or to chip them off with strong scissors."

Many Daffodils are very pretty in pots, especially the group comprising the pearly Angel's Tears (*M. triandrus*), the Basket Daffodils or Hoop Petticoats (*Corbularia*), and others, but pot culture is dealt with in another chapter.

Ornithogalum (*Star of Bethlehem*).—Attractive plants bearing heads of white flowers. *O. arabicum* and *O. pyramidale* throw up flower-spikes four feet in height, while *comosum*, *latifolium*, the greyish green *nutans*, and *umbellatum* are also attractive.

Puschkinia scilloides is a pretty little blue-flowered plant suitable for nooks in sunny borders.

Schizostylis coccinea (*Winter Flag*).—This bears crimson flower-spikes in autumn. Its place is against a warm fence, wall, or in some sheltered corner. It enjoys rather a moist soil, but nothing approaching stagnation. During very severe weather protect the crowns with bracken or similar material.

The Spring and Early Summer-Flowering Scillas.—The common blue-bell (*S. nutans*) is well known throughout England, and

many of the family are well worthy of garden culture, amongst these being *S. bifolia*, *S. hispanica*, *S. italica*, and *S. sibirica*. The Scillas form a very charming family of bulbs, very easily grown by the amateur. They are a sheet anchor in the small garden from the time of *S. bifolia*, the earliest of the family to bloom, until the spikes of *S. campanulata*, or *hispanica*, as it is also called, have faded. *S. bifolia* is a very pretty kind, very hardy, and with spikes of deep blue flowers a few inches high, whilst there are varieties of it, such as the pretty *taurica alba* or *candida*, white, *rosea*, or *carnea*, the names indicating the flower colouring. *S. sibirica* has intense blue flowers, and is very free and cheap. The amateur should plant the bulb in quantity. Of the bluebell there are white, rose-coloured, and French-grey varieties, but more satisfactory in a confined place is *S. campanulata*, the Spanish Scilla, which will flourish in town and country gardens alike. It is very strong in growth, with stems eighteen inches high, and deep blue, but there are varieties of it, white, rose, and pink, and all vigorous. The Spanish Scilla will grow in quite a shady place. Put the bulb two inches deep in autumn.

Snake's-head. *See* Fritillary.

Snowdrop. *See* Galanthus.

Sternbergias (*Winter Daffodil*).—*S. lutea*, the Winter Daffodil, bears bright yellow crocus-like flowers in autumn, and is supposed to be the "Lily of the Field" of Scripture. The Sternbergias form a beautiful group of autumn-flowering bulbous plants. They are not in the least degree difficult to grow. Sometimes newly-planted bulbs will not bloom, but this is frequently due to the imported ones being of very small size, so much so, that two years elapse before they are sufficiently strong to flower. After that period they increase. A light and well-drained soil is needful, and, if heavy naturally, lighten it by adding grit, leaf-mould, and road-scrapings. Plant the bulbs early in August, at a depth of eight inches. A form of *S. lutea*, called *augustifolia*, is not so shy flowering as the type. *S. l. major* is another excellent form, with very rich yellow flowers. *S. l. fischeriana* blooms in February, or soon after. All the autumn-flowering forms of *S. lutea* produce foliage at the time of flowering. A very important species is *S. macrantha*, which is also autumn-flowering, sending up leaves in early spring. The flowers are twice the size of those of *S. lutea*. *S. colchiflora* is of smaller growth, but the rich yellow flowers possess quiet beauty.

Tigridias (*Tiger Flowers*).—These gorgeous flowers cannot be considered hardy except in light soil in especially favoured districts. *T. Pavonia* is the most familiar kind. Its flowers are of brief duration, but a succession appears, so that their short life is unnoticed. The flowers are about six inches across, and intense scarlet, splendidly spotted and dabbed with crimson. There are beautiful forms, such as *grandiflora*, which, as the name suggests, is conspicuous for its larger size, and the yellow blotched with red *S. conchiflora*. *T. Pringlei* is valuable for its scarlet bloom. Tigridias require a hot, moderately dry, sunny place, such as many borders offer. Generally it is necessary to lift the bulbs in autumn, much as one would a Gladiolus, but in the

quite southernly parts of the country they will be quite happy in the ground all winter. Plant in the middle of April, putting the bulbs six inches deep, and a little sand for them to rest upon in the hole, to reduce risk of rotting off to a minimum. Lift the bulbs in November, and store in a dry cellar, or some place free from frost.

Triteleia uniflora is an attractive flower, with quantities of white star-shaped blossoms in April. It does well in light soil in raised positions, and associates admirably with the Scillas.

Tulips.—No flower of the early year is brighter than the Tulip, and if the late kinds, the Gesners and others, are planted, the colour pictures are prolonged to the threshold of June. The bulbs should be planted about four inches deep and half a foot away from each other, and they receive considerable benefit if the surface be mulched with cocoa-nut fibre refuse and well-decayed manure. Plant in October or in early November, and it is better to lift the bulb after flowering, *i.e.* when the leafage has died down, and store in a cool place until following autumn; but as this lifting and replanting considerably increase the labours of the garden, they may be carried out once in three years, not left for a longer period than this. Pot-culture is described in another chapter. There are many beautiful early varieties, usually known as "Dutch," and these commence the Tulip season. Plant them in beds, borders, or any spot that is wanted to look bright and pretty in the spring. The most effective are as follows: Mons. Tresor, golden yellow; Ophir d'Or, height six inches, fine yellow globe-shaped flowers; Maes, a brilliant scarlet colour, excellent for beds, height eight inches, very effective; La Matelas, seven inches high, silvery pink and white; Proserpine, very popular, nine inches, bright rose; Keizerskroon, a well-known showy Tulip, ten inches, red and yellow; Rosa Mundi, blush white, seven inches to nine inches; Couleur de Cardinal, one of the best of all the single early or mid-season Tulips, colour crimson scarlet, very useful for the garden, edge of beds, &c.; Pottebakker, white; Pink Beauty, rose, passing to white; Van de Mer, purple; and Queen of the Netherlands, pink. These are all single.

Of the double varieties choose or select from Vuurbaak, rose scarlet, nine inches high; William III., orange scarlet; Imperator Rubrorum, scarlet; Voltaire, crimson, each ten inches high; and Rose Blanche, pure white.

The late Tulips are important, as they include many of the handsomest garden flowers in existence. The Gesners Tulip (*T. gesneriana*), parent of the byblœmens, bizarres, and other types precious to the exhibitor, but which are less effective in the garden than the pure self, is a flower that should be everywhere. It has a tall scape or stem about a foot high, more in some positions, and this bears a goblet-shaped flower of crimson colouring, with blue-black suffusion at the base inside. A colony or group of this bulb is a brilliant sight, especially in midday when the sun opens the glowing goblet to catch every ray. *Spathulata* is a beautiful form of it. The late Tulips are self-coloured for the most part, and therefore more effective than streaked or spotted flowers. This, of course, any one can understand. *T. elegans* is a beautiful Tulip,

very graceful, the florets lengthening into almost a tail, and deep crimson. *T. macrospila*, carmine rose, very sweetly scented, is an excellent Tulip; the yellow *T. retroflexa*, the deep crimson *T. fulgens*, and the Parrot Tulips are indispensable. The bulbs are not unreasonable in price. A dainty coloured Tulip is Picotee, white with pretty rose margin; and also of note is Golden Crown, golden yellow, edged with orange-yellow. Bouton d'Or is one of the finest yellow Tulips in existence.

Many species are chiefly for the rock-garden or to form pretty groups, and these include the Lady Tulip (*T. clusiana*), with charming rose and white flowers. Give this a warm soil and shelter. *T. Didieri* and *T. billietiana*, a form of it with yellow flowers, are handsome; those of the former are red. Other good kinds are *T. Eichleri*, scented; the very late *T. flava; T. sylvestris*, the wild Tulip, very useful for planting in grass, a sweet-smelling species; *T. Greigi* is not a beginner's Tulip unless he is an enthusiast; but, of course, many rare and troublesome things to grow will be secured that are not mentioned in this book. *T. Greigi* has gorgeous flowers, usually vermilion in colour, but they change considerably; they are about three inches high and nearly five broad, and should be grown in a warm, well-cultivated soil; height seven inches. Another brilliant species is *T. kolpakowskyana*, one foot high; the flowers are red varied with yellow markings. *T. montana* is red or yellow—the flowers come of both colours; it is a hardy, vigorous little Tulip, six inches high. *T. vitellina* is of a soft yellow tint, a very beautiful species, refined, and yet in a way showy.

The Parrot Tulips are a strange class. The flowers are of quixotic form, the segments gashed and cut into quaint shapes, spattered with crimson and yellow colouring. They are not always sure to flower, but their curious shape and remarkable colours are fascinating to many. "Mixtures" give good assortment of kinds, but named varieties may be purchased. Their origin is uncertain.

The "Darwin" race of late Tulips is useful for prolonging the season; they are about the last to expand. A large trial of these took place in the late May of 1900 in the Royal Horticultural Society's Gardens at Chiswick, and the following were selected as amongst the best for colour:—Fraulein Amberg, two feet high, varying in colour from deep violet to mauve, with a light centre; Auber, not quite so tall and sturdy as the former, its flowers violet-purple, shading to heliotrope, with bluish centre; Donders, very effective, crimson-maroon, with blue centre, very lasting, and with stout stem; Rev. H. H. Dombrain, bright red, with purple on the back of the florets, two feet high; Gustave Doré, rose, with white band down the centre of each floret, height, two feet; Prof. M. Foster, scarlet suffused with rose, and stained with rose carmine on the exterior, centre inky blue, height, twenty-six inches; Europe, rose-scarlet, the inner segments striped with white down the centre, and flushed with purple outside; Mrs. Farncombe Saunders, deep rose-scarlet, two feet high; and Phœcia, rose-scarlet, outer segments stained with carmine, inner base blue-black.

TUFT OF THRIFT (ARMERIA) IN ROCK-GARDEN.

THE ROCK-GARDEN

ROCK-GARDENS have of late years become increasingly popular in the British Isles, and deservedly so, since they give opportunities for appreciating the beauties of numberless Alpine plants within a limited space, while one of their chief merits, from the amateur's point of view, lies in the fact that the proprietor, if he has a fair knowledge of the elements of gardening, is enabled to do all necessary work with his own hands. The plants may be attended to while he stands on a stony pathway or rock steps, instead of upon the moist earth of the mixed border. In dividing and planting the porous soil scarcely soils the fingers, and stray weeds may be removed by the feeblest hands. The rock-garden, if thoughtfully planned, offers, with its varied exposures and elevations, a congenial home to a large assortment of charming flowering plants that will paint the ledges and crannies with bright colour from the early days of spring until past midsummer. In mild seasons the Arabis spreads its white veil over the rock-face in the first days of March, followed by the Aubrietias, purple, crimson, and blue-grey, the dwarf Phloxes, Mountain Pinks, brilliant Sun Roses (*Helianthemum*), and a host of other lovely things that provide a succession of bright colours through a long period.

Much, however, depends on the formation of the rock-garden, and in this, as in other cases, there is a right and a wrong way of going to work. Unfortunately, in the majority of instances, the latter method, or want of method, has been followed, as may be seen from a casual inspection of the numberless so-called "rockeries" that deface villa gardens and others throughout the length and breadth of the land. The constructors of such abominations appear to have been utterly ignorant of the requirements of the plants destined to occupy these sites. In many cases these "rockeries" convey the impression that a cartload of rough stones or clinkers has been shot out upon a heap of soil; in others flat stones are embedded in pairs at right angles to each other, in almost perpendicular banks, each pair enclosing a triangle of soil, which soon becomes parched by the sun; while there are yet others, whose designers have evidently spared no pains or expense to

produce a masterpiece of art, with the result that their rock-gardens must remain till the end of time places of rocks, and not of flowers.

In *Forming a Rock-Garden* it must be borne in mind that the object in view is to grow beautiful plants, and to display to the best advantage, amid appropriate surroundings and in robust health, the flowers that enamel the rugged Alpine slopes, and streak the creviced crags with colour. The mission of the rocks is to afford congenial crannies for the roots to explore, and to provide surfaces for trailing growths to veil with greenery and blossom. They are there to act as a natural setting for the flowers, which should spread in tinted breadths over the spaces as freely as on their native ledges. The nearer Nature can be approached the more natural will be the effect, and rocks should therefore emerge from the soil in such a manner as to give the idea of an outcrop of the living rock from a mountain side. Where rock-masses are built by placing stones against one another, either in a horizontal or sloping position, those having flat surfaces should be used in order that the form of natural rock-stratification may be presented. On no account should cement be used in the rock-garden, but all fissures and seams between stones should be crammed with soil, great care being taken that no vacuum exists between the rock-faces. Should these occur, losses are certain to ensue through the dry air entering the crevices and parching the roots. It is well to excavate, where the rock-garden is to be formed, to a depth of eighteen inches, in order that thorough drainage may be insured, since stagnant moisture at the root is fatal to many Alpines. A depth of fully three feet of soil should be provided, as many rock plants send their roots downwards to some distance between the masses of stone, where they remain cool and moist during the hottest weather, while foliage and flower enjoy the full benefit of the sunshine. Sandy loam mixed with some peat, to which a good proportion of sandstone chips and grit has been added, will be found suitable for the majority of rock plants. Some, however, prefer peat, while others like a calcareous soil, in which case broken limestone should take the place of sandstone. The mixture of stones and grit with the soil is a great help to Alpines, as it prevents rapid evaporation. It is generally best to use country stone—that is, stone easily procurable in the locality—in the construction of the rock-garden, unless the stone be of a nature likely to crumble away. No spar or carved stonework should be employed, while old tree roots should be rigorously excluded, as these breed fungi. Simple paths only are necessary in the rock-garden.

A ROCK-GARDEN WITH PRIMROSES BY PATHSIDE.

Here and there along the irregular edges, Sea Pinks (*Armeria*), Sedums, Saxifrages, Corydalis, and other plants, growing out into the walk, will create an informal verge, while in the chinks of rough rock-steps the *Erinus alpinus* will blossom freely, and *Arenaria balearica* spangle the perpendicular stone faces at the side with countless tiny white blossoms. Some plants, such as *Ramondia pyrenaica*, prefer shade, while others delight in the fullest sunshine, and for each class sites are readily provided in the well-arranged rock-garden. In the lowest level a bog bed may be formed where hardy Cypripediums, Trilliums, and other moisture-loving plants will flourish. Running water, though by no means a necessity, adds much to the charm of such a garden, and where this is procurable a streamlet, falling from the higher to the lower levels by a series of cascades, passing here over rocky slabs and there beneath overhanging outcrops of stone, and entering at length an informal rock basin where the hardy Water-lilies flower, produces a pretty effect. The surroundings of the ideal rock-garden should be picturesque, and it therefore follows that the most perfect is one that is not overlooked by houses or buildings. Such a site is, however, out of the question in the majority of small gardens, in which the rock plants will flower as profusely as when provided with a less formal environment. No trees should overhang the rock-garden, but the shelter of a belt of shrubs, planted at a sufficient distance to preclude their roots robbing the soil, is a decided advantage. The selection of plants for the embellishment of the rock-garden is largely a matter of taste. The amateur can provide a bright display by confining his attention to the hardier section, such as Arabis, Aubrietia, Phlox, *Omphalodes verna*, Alpine Wallflowers, Alyssum, Arenaria, Armeria, Cerastium, Corydalis, Helianthemum, Iberis, Sedum, and the commoner Saxifrages; or he may choose to try his hand at some of the rarer gems that star the Alpine heights.

THE LAWN: MAKING AND MANAGEMENT

FEW gardens are without grass of some kind. To call this "grass" in all cases a lawn is incorrect. Many lawns are patches of bad turf, but every one appreciates the close, deep green "velvet pile" that good seed and good management will give.

In *Forming a New Lawn* the ground must be carefully prepared. An open, level piece is preferable, but where this is not obtainable the soil must be removed from the highest to the lowest parts until the surface is quite level. If the ground is wet and retentive, drain pipes three inches in diameter should be laid in two and a half feet deep, each row of pipes being twelve feet apart. These will carry off the surface water. The pipes must have a gentle fall, and be connected with a cross main drain with a safe outlet.

The ground must be well dug to a depth of eighteen inches or two feet, and if poor, enriched with well-decayed farmyard manure. Digging completed, tread and rake the surface, finally well rolling it to make it firm. Where the natural soil is not of sufficient depth more must be added, and it should be wheeled, not "carted," on to the plot, as the cart wheels make hard ruts, and where the soil subsides an uneven surface is left. Planks should be laid down for wheeling on. The surface soil to a depth of three or four inches should be of a rather fine character, as the seed germinates more quickly and the grass gets a better start in such a medium than in one of an opposite nature. The quickest and probably the best means of securing a good lawn is by covering the plot with grass sods, but unless they are of first-rate quality, the more common method of sowing lawn grass seed should be resorted to. The sods may be laid down any time during fine weather from October to April; if laid later, they are apt to suffer from drought during a dry spring. From one and a half to two inches is a good thickness for the turves, and they should be laid close together, and afterwards well rolled at intervals throughout the winter—preferably after copious rains. If all goes well, the grass will commence to grow freely in April,

at which time the surface should be well swept with a stiff broom in order to remove all stones and rubbish, which, if allowed to remain, would cause injury to the mowing-machine or scythe.

Management.—Allow the grass a little grace before mowing it for the first time to encourage root action, and if the spring be hot and dry, once a fortnight will be sufficient to mow during April and May. If possible, the lawn should be rolled every time it is mown during the first summer. If grass seed is sown, obtain it from a reliable firm, because some samples contain a large percentage of plantain and other rubbish. April and September are the best months for sowing, and the quantity of seed required is from half-a-pound to one pound to the rod, or from three to six bushels to the acre. Well tread or roll the surface, and sow the seed quickly broadcast, afterwards covering it with fine soil and again rolling. As chaffinches and small birds are fond of grass seeds, it will be advisable to give it protection until the plants make their appearance. Covering the ground with bushy Pea rods answers well. When the grass is in active growth, give a moderate dressing of an improved fertiliser whilst the ground is moist with rain. When the grass has grown three or four inches high cut and roll it. Lawns that soon suffer from hot sun, owing to the soil being shallow or sandy, should receive a liberal dressing of fine soil and artificial manure annually. Mix the manure with the soil, and spread it evenly over the surface, about half an inch thick, in January or early in February. Rain will then wash in the manure and most of the soil, and if the grass is well swept and rolled early in April, previous to mowing, its density will be increased and the quality improved. Where the soil is fairly deep and good the turf will remain in good condition for an indefinite period, if well attended to, but on shallow, hungry soil it wears out in time, even if top dressed annually. The only course then open is to remove the soil to a depth of at least twelve inches, replace it with the best soil procurable, and after levelling and rolling, either turf it over or sow it with the finest lawn mixture. When good soil and seed are used few daisies, plantain, and other weeds occur. Grass seeds can hardly be sown too thickly for making new or renovating old lawns. For light or shallow soil it is always advisable to mix a fair quantity of clover with the grass seed, as, being of dense growth, it prevents the surface soil from becoming parched.

Weeds.—Daisies and other weeds should be eradicated. Bentley's lawn sand, if applied according to printed directions sent with each bag or tin, is a potent destroyer of them.

Daisies may also be dug up with an old knife. Previous to commencing this operation stretch two garden lines across the lawn three feet apart, then work between them; fill up the holes that the daisies are taken from with fine soil, which should be beaten firmly into them. The bare places will then soon be covered with grass. If daisies are numerous dig them up early in April, and after the holes have been filled up, a slight dressing of artificial manure and fine soil should be given.

Mowing is an operation that requires considerable judgment. As a rule early April is the best time to begin, and if the grass is dense and vigorous it may be mown once a week. On the other hand, if thin and weak, once in ten days or a fortnight will be often enough. If possible always mow the grass when dry, for if mown when wet it never looks well, besides which wet grass clogs and strains the machine. For lawns of large extent horse or pony machines are necessary, but leather boots must be placed on the animal's feet to prevent them from cutting into the turf. For small lawns use hand machines. Before commencing to mow in spring the edges of the lawn should be well rolled, and an inch cut off them with an edging knife.

Lawns are frequently neglected during winter, consequently worm-casts become numerous, and the turf gets coarse. The grass should be swept and well rolled in fine weather at least once a month throughout the winter. This will keep it not only in a healthy but also a presentable condition. Where practicable a good supply of water should be laid on in close proximity to the lawn, in order that it may be well watered in dry weather by means of a hose. A verdant lawn is beautiful and restful, and may be made to remain so by employing a little cheap labour each year, and by giving an annual dressing with fine soil and an approved fertiliser.

ROSE ARCH IN OLD GARDEN.

ROSES

A GOOD start in Rose-growing means future success. Many failures in gardening are simply the result of beginning in an unreasonable way, thinking nothing perhaps of the soil, the varieties, whether they are vigorous, free, or the reverse, and the treatment necessary to ensure a happy life. The Rose is the flower of the English garden, and its value increases as we grow accustomed to the desires of the Tea-scented varieties, and know something of the wonderful beauty of the climbers, the Bardou Job, Carmine Pillar, and many other rambling kinds that fling their flower-laden shoots over arch, pergola, and pillar, and sometimes look into the window to flood the house with perfume.

The Soil is a matter of some importance, but the majority are compelled to make the best of the garden as it is, and are not in a position to bring in a large amount of fresh material. Ground that has been occupied with vegetables is usually in excellent condition for Roses. The best position in the garden should be given to the Roses. It is unreasonable to expect an abundant harvest of flowers from plants under the shade of trees, or soil already filled with roots from a neighbouring shrubbery.

We will assume, therefore, that the bed is in the centre of the garden, or some spot about which the ardent rosarian would not quarrel. The Rose absolutely revels in sunshine and air, and the aspect cannot be too carefully selected for the bed. A convenient size for the bed would be about twenty feet long and five feet wide. This would provide space for about thirty Rose bushes. The preparation of the bed is of first importance, and should be carried out, if possible, not later than September, if autumn planting (by far the best) be adopted. Unquestionably the best soil for all Roses (except those of the Tea-scented and allied tribes) is a strong, rather heavy, even clayey loam. In this soil the Hybrid Perpetual kinds are very happy, but if light and sandy, then the Tea-scented and Hybrid Teas should predominate. In making preparation for bastard trenching or double digging the bed, mark out the length and width with a line.

Divide the bed off into six sections as illustrated. The soil of section A is dug out to the depth of the spade and placed on the path at the other end of the bed. The broken soil is then shovelled out and placed at the end also. The second or lower spit of section A is then broken up with a four-pronged fork, well incorporating with the soil thoroughly decayed farmyard or stable manure. The soil must not be brought to the top, but kept in the same place. When this second spit appears heavily charged with water, artificially drain the bed. To do this, the second spit must be thrown out, and about four inches or five inches of large stones, clinkers, or broken bricks put in the bottom, and the second spit returned. It is wise to raise the bed four inches or five inches when the soil is badly drained, as stagnation means that the young roots rot away. When manure has been mixed with the bottom spit, the top spit of section B is put into section A. The shovellings of section B placed in A will complete the first trench. When much manure, either liquid or solid, has been used on the soil in the past, a dressing of chalk would improve its fertility if incorporated with the surface soil at the rate of two pounds per square yard. When the soil is very light, *i.e.* sandy or gritty, put a good layer of cow manure during trenching below the bottom spit of soil. Burnt weeds and other garden refuse are excellent to mix with the top soil. These may appear unnecessarily elaborate preparations, but the bed when thoroughly made will last for years, with the usual attention required by the plants.

Planting.—Early planting is one of the most important points, and choose from the middle of October to the end of November. Roses may, however, be planted in the spring, or in winter when the weather is favourable.

Purchasing.—Give the order to the nurseryman early, or, better still, go to the nursery and bring the plants back with you. If foliage is still on the growths remove it, and to prevent the wood shrivelling, make a trench in a shady spot and place the roots of the bushes in it, covering them with soil until they can be properly planted. If the arrangement of the kinds has been well considered on paper the Roses should be so laid in the trench as to enable them to be drawn out as required without disturbing the others. Do not leave their roots exposed to the air for even a few minutes. Tea Roses must be upon the seedling or cutting briar, and the last-mentioned is the best stock for the Hybrid Perpetuals. When about to plant have a bucket of water ready at hand to dip the roots in. Keep the plants covered with a sack or mat until required. Trim over the jagged ends of the roots with a sharp knife, and if the branches are more than two feet in length cut the surplus away, as this prevents the wind from moving the stems to and fro after the plants are in their places. In planting make a hole in the soil about one foot each way, and deep enough to allow space for the roots to be spread out carefully. Dwarf or bush Roses are either on their own roots, that is to say, struck from cuttings, or budded upon a foster stock. This foster stock is of four kinds—the Briar-cutting, the Seedling Briar, Manetti, and De la Grifferaie. These are described under the heading of Stocks. All these stocks spread their roots outwards, except the

seedling briar, which makes a long tap-root, and must be shortened to prevent it going too deep into the cold soil below the first spit. Place the junction between scion and stock an inch below the surface (not more). The roots having been dipped in water, hold the plant in the left hand and arrange the fibres to the right and left. It is not labour lost to prepare ready a bushel or two of fine soil for placing immediately over the roots. Give them a thin covering of this, and lift the plant gently up and down to allow the soil to run among the fine roots. Put some more soil on and tread firmly. Roses like firm planting when the land is not wet. Do not quite fill up the hole. When a saucer-like cavity is left around each plant this facilitates watering should the weather remain dry. After the plants have been in the soil about a week give one good watering, unless rain has intervened, then fill up the cavity with fine dusty soil and allow this to remain as loose as possible. Do not plant when the ground is wet and sticky, but leave the plants in the trenches. When planting is finished the surface soil should be left rough, not raked over and made neat. Earth up the bushes in November in the same way one would potatoes, hence the wisdom of planting the bushes in rows. All the growths covered with the soil are quite safe from severe frosts. The Hybrid Perpetuals should be earthed up as well as the Teas. One never knows the kind of winter to expect, and there is comfort in the thought that the Roses are safe. Even when the soil is frozen very hard the growths remain uninjured. When Roses for some good reason cannot be planted in November wait until February and March unless one is blessed with a fine January. In the case of deferred planting prune the plants back to three inches or four inches from the base before planting. Many thousands of Roses are killed every year through adopting the "filling up gaps" practice. By making a hole and planting a Rose between two established plants this hole attracts an undue share of moisture, and the roots suffer considerably. Far better replant the whole border or bed, and remember that it is unwise to allow fresh manure to come immediately into contact with the roots.

To plant a bed twenty feet by five feet containing a good representative collection, and arranged according to habit of growth, having the strongest in the centre row, the following diagram will indicate the position of each variety according to the number against the name :—

20 feet.

5 feet.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Distance to Plant.—Bush Roses may be planted as close together as fourteen inches in the rows, and eighteen inches from row to row, but

eighteen inches to twenty-four inches each way is better. Many growers for exhibition prune their plants severely (a practice alluded to under the head of pruning), then fourteen inches is sufficient. Standard Roses are usually given a distance of two feet six inches to three feet each way.

Stocks for Roses.—Many beginners, when ordering Roses, desire them on "their own roots." It should be clearly understood what an own-root Rose is: it is one raised from a cutting of any particular variety; but an ordinary bush Rose is one that is budded or grafted upon a foster stock, either in the stem near the root or upon the root itself. Own-root or cutting Roses are very satisfactory for some varieties, but they are not always procurable. The foster stocks usually employed are the Manetti; Hedge Briars from cuttings known as the Briar-cutting; Briars from seed known as seedling briars, Hedge Briars to make Standard or Tree Roses, De la Grifferaie, and Polyantha stocks. But Roses may be budded upon almost any variety of Rose—in fact, one could bud an old Rose all over with a modern kind if so desired. Where a foster stock is used there is always a danger of suckers springing up and choking, as it were, the kind we desire to possess. We have known instances where Marechal Niel has been planted and the plant killed by frost. The owner, however, was unaware of this, and instead of the Marechal Niel he cultivated for some time the stock that sprang up from the roots, and wondered why it produced only tiny pink flowers instead of rich blossoms filled with perfume. It may be as well to briefly describe the Manetti, Briar, De la Grifferaie, and Polyantha stocks.

The Manetti Stock cannot be mistaken for the cultivated Rose. The foliage is of a tender grass-green colour, the leaves seven in number, whereas most of the Hybrid Perpetual, Tea, and Hybrid Tea tribes have five only; the wood in the young sucker state is a reddish brown, and the prickles of the same colour. In about two inches of its growth there are two or three large prickles, interspersed among them being numerous tiny prickles resembling the cylinder of a musical-box.

The Briar Stock is so well known that it seems superfluous to describe it. There are, however, many varieties of the Wild Briar, some of them much resembling the Ayrshire Roses, but the usual form is very prickly, the foliage of a dull dark green, and there are seven leaves on a stalk.

The De la Grifferaie Stock may deceive the novice. It has large leaves like a cultivated Rose, but they have a peculiar downy appearance and are purplish-green in the young state. The wood is thick and of a red colour, spines large and about equal in size. The tip of the growth has quite a mealy look.

The Polyantha Stock has a flower like the Blackberry, nine leaves on a stalk, very pale but dull green, and the edges are prettily notched. The tip of the growth is downy, and the wood is green with brownish spines.

As the best bush Roses can be obtained from the leading growers from ninepence to one shilling a piece, probably it would not pay the beginner to bud his own Roses. Later on, however, he may wish to do so. As the cuttings are inserted in September at the same time as those of cul-

ROSE REINE OLGA DE WURTEMBERG OVER BALLOON-TRELLIS.

tivated Roses the method is described under the heading of Own-Root Roses, and as for the seedling briars it is not worth the trouble involved for the amateur to attempt to raise them, when they can be bought so cheaply. Stocks planted for budding should be secured in the autumn, the roots put into some soil temporarily and protected from frost until February. When planted before this, hard frost is liable to raise the plants out of the ground. Plant them in rows two feet apart in the best position, and the stocks six inches apart. If they are to remain permanently where planted, and this plan is strongly advised, more space should be given between the plants, say twelve inches. Dwarf stocks must be planted rather shallow, their roots being about six inches below the surface. When about to bud the stocks hoe the soil away, and return it again after budding is completed.

Standard briars may be bought from labourers for one shilling to one shilling and sixpence per dozen, but do not buy them unless they have some small fibrous roots, and see that they are not green and sappy. Plant these briars in November the same distance apart as the dwarf stocks, and their roots about eight inches deep. All stocks should be grown in good soil, and hoe frequently and deeply. Thin the growth of standard stocks in June, retaining three of the best to receive the buds.

Pruning.—The beginner in Rose-growing is generally puzzled with regard to pruning, which is, however, quite a simple operation, its object being to induce the plant to make new wood. Readers should grasp this fact, and then insect pests, green-fly, and the thousand ills that Roses are heir to will become less troublesome. The time to prune for all districts, except those that are very late, is early in March. Exception should be made in the case of Tea Roses, pruning of which is best deferred until the first week in April. The first pruning of the previous autumn-planted Roses should consist in shortening the growths to about six inches from the ground.

All varieties do not grow alike, some producing two growths the first year, and some only one, but the first year in all cases cut back to within six inches of the ground and close to an eye or leaf-bud looking outward. Newly-planted climbing Roses on walls should be pruned in this way the first year. The second and following years the growths are retained almost their entire lengths, merely clipping them and cutting out old and dead wood. Another point to remember is, that the *harder* the wood and the *less* pith it contains the more vigorous is the growth. Cut out very soft, pithy shoots clean away to the base. The second year the pruning must be somewhat different. Growths on unusually strong varieties that make yearly shoots some four feet to five feet in length should be left quite eighteen inches long. If quite hard they might even be left three feet long, and would then produce three to five new growths at the top. Prune the second year Hybrid Perpetual, Hybrid Teas, Teas, Noisettes, Polyantha, and Bourbons, except the strongest growers, to within six inches to nine inches of the ground. With regard to the Japanese, Austrian Briars, Penzance Briars, Scotch Roses, and Monthly Roses, merely remove a few inches from the extreme ends. Shoots on

Moss Roses, Damask Roses, Maiden's Blush, Hybrid Chinese, and Gallicas may be left from twelve inches to eighteen inches long, but reduce the number of old growths. Roses of the type of Gloire de Dijon, if grown as bushes, may be left two feet to four feet long, and they will flower up the shoots. Do not prune into the old wood, but always cut back the growths made the previous season. Old wood merely yields blind or flowerless shoots.

The Rose grower should always endeavour to cut away entirely some of the old growths each season. This should be accomplished in September. There is a sacrifice of some autumn bloom, but the young wood is strengthened for another year. Four to six good, sound one-year-old growths upon each plant, even when the bushes are twenty years old, are better than a bush with innumerable shoots. Many Roses flower upon the new growths no matter if pruned to the ground line each year. La France, Baroness Rothschild, and others are of this nature. By pruning to within five inches or six inches of the ground, splendid new wood is obtained. If an abundance of bloom be wanted such rigorous treatment is fatal. The longer the growths are retained for this purpose the better, but even in this case it is well to remove a whole growth or two each year to allow air and sunshine to play upon the heart of the bush. Remove in the third year the strong centre growth quite to the base. By this time younger growths will have appeared to take its place. It is always best to prune to dormant eyes. Some years the growths start out so early that one must prune back severely to find dormant buds. With very strong growers that have, say, five or six long growths, these growths, through cutting back to about eighteen inches and then spreading outward by means of galvanised iron pegs, result in a very fine plant with plenty of flowering growths; whilst this bending outward compels strong new growths to break out from the base which the following season will be used for flowering, and those flowering this year will be cut away.

MEDIUM GROWING ROSE, TWO YEARS OLD; CROSS LINES SHOW PLACE TO PRUNE

Standard Roses of the same kinds as dwarfs are subjected to a similar pruning. Only quite strong growers should be grown as standards. The climbing Teas make very fine heads, but all Teas as standards, except the familiar Gloire de Dijon tribe, run great risks of being killed in a hard

winter, therefore they are not recommended. Strong-growing varieties on standards that make long, half-pendulous growths should be lightly pruned, merely well thinning the centre. With climbing Roses the object should be to retain all the growths of the previous summer almost their entire length, removing perhaps five inches or six inches of the extreme ends. During the summer and early autumn, after flowering, look over the climbers, remove very old growths to the ground, and jealously guard the current season's wood, when, if they are spread to the right or the left in the spring, they will flower from almost every eye or bud. These remarks apply especially to the climbing Tea and Noisette Roses. The Rambler Roses should not be pruned, as one may then obtain glorious masses of flowers; but this does not mean that very old and dead wood should not be removed. The commonest climbers should be thinned. Autumn is the best time for this work. Untie or unnail the plants, and place them on the ground so as to remove unnecessary growths, then the plants may be renailed to the wall, or tied to the arch or pole. Where walls are available plant the Tea and Noisette Roses against them, but the Evergreen, Ayrshire, Crimson Rambler, Yellow Rambler, &c., are best upon arches, arbours, clambering up posts or stumps of trees, or throwing their long growths over hedges, banks, or any similar positions. A beautiful way of growing some of these Roses is as isolated specimens; let them grow as the wild Roses in the hedges.

STRONG GROWING ROSE; LEAVE SHOOTS ALMOST INTACT

Watering and Syringing.—Instead of using so much patent manure use the hoe more frequently, and keep three inches or four inches of the surface soil loose. This considerably counteracts drought; it allows the air to penetrate the soil, and admits the warm rays of the sun. Always hoe after rain, at each artificial watering, and use the syringe freely to cleanse the foliage. When the garden is near a large town sponge the foliage now and then, but avoid wetting the leaves during bright sunshine. Syringe early in the morning, before seven o'clock. The city man as well as the artisan will find the work among Roses a delightful occupation, especially before breakfast. When hoeing is constantly practised Roses will not as a rule require artificial watering before the flower-buds appear, except in very dry springs, and then water only newly-planted kinds. It is when foliage is ample and almost fully expanded that the roots take up most moisture. The best time to water

is the end of May and early in June; if dry, give a thorough good soaking with plain soft water about twice a week. The plants also appreciate gentle syringing in the evening of a hot day. Mildew often results through unseasonable waterings and overdoses of artificial manures, which burn the tiny rootlets. A dressing of lime and soot soon after pruning is helpful; indeed, both soot and lime are not sufficiently used.

Manures.—Roses are not gross feeders, but they like good food. Phosphates are very important to promote abundant flowering. Bone-meal, which is so rich in phosphate, is an excellent fertiliser, a light sprinkling in March being very useful and lasting. Night-soil is excellent, but must be applied with care. Make a drill at the end of May down the middle of the rows, as though one were about to sow beans. Pour the night-soil into the drill and return the earth. The rains will wash the fertiliser to the roots. Never give liquid manure in dry weather unless plain water has been previously applied. An excellent manure is known as Tonk's, and should be applied early in spring immediately after pruning. Hoe the ground, then sprinkle all over the soil at the rate of $\frac{1}{4}$ lb. to the square yard. The recipe is as follows:—

	Parts.
Superphosphate of lime	12
Nitrate of potash	10
Sulphate of magnesia	2
Sulphate of iron	1
Sulphate of lime	8

Liquid manure can be easily made by setting up a paraffin cask in an out-of-the-way corner. Put a bushel of fresh cow manure into a bag, tie the end up loosely, and put the bag into the cask, which should then be filled with water. Give this liquid in equal proportions, and change the manure every ten days or so. If sheep droppings are procurable, put some in the tub in addition. Ichthemic, or fish guano, is a splendid stimulant for Roses. Do not give liquid manure to weakly plants, only to those in full vigour. It must not be given too early, but wait until the flower-buds can be just seen or felt at the points of the shoots, or gross, green-centred flowers will result. When the buds are seen, an application of manure water twice a week may be given. Withhold liquid manure when the flowers show colour. After first flowering a few doses are beneficial to such Roses as bloom a second time. Manure water may be given to Roses in winter to their great advantage.

Mulching the surface during June and July is important. The best material is the peat moss litter from a good stable. Hoe the surface deeply before applying it, then lay on about three or four inches.

Thinning and Disbudding.—Pruning should be supplemented by thinning the young shoots in May. Remove all that appear to crowd the centre of the plant. If one growth carries three or four young shoots at its end this will suffice. Growths may be entirely removed in May when they appear too crowded. If variety is wanted, as well as quality, put the plants closer, and retain not more than two of the best

HYBRID TEA ROSE (GRAND DUC. ADOLPHE DE LUXEMBERG)

growths of the previous summer. Disbudding usually applies to the reduction of the number of flower-buds. Where show blooms are required remove the side buds and retain the centre one, which, if faulty, must be removed, and the best of the side buds retained. Pinch off all new growths as they spring out of the shoot that is crowned with the flower-bud. Tea Roses require this if show blooms are desired, but for garden decoration leave them alone. Plenty of growth means plenty of flowers.

Budding.—This operation as well as many another in garden craft is very simple when the art has been acquired. The illustration represents a piece of Rose growth. At the base of each leaf-stalk is an eye, or leaf-bud, which contains the germ of a new plant. To be successful in budding this growth must be "ripe," that is, it must have flowered, or on the point of so doing. The growths first produced are the best to use for budding. They should be firm, and the spines or thorns be easily rubbed off. If the latter are soft and juicy the wood is not ripe enough, but it is more important to see that the stocks "run well," that is, there should be an abundance of sap in the plant. In a very dry summer it is sometimes necessary to water the stocks a day or two before budding. Always bud the standard briars first, for they cease to grow long before the dwarf stocks. The latter should be budded as close to the root as possible, especially if the plants are wanted for potting up. Standard briars should be budded in July, and the dwarf stocks during August. Insert the bud on dwarf stocks on the west side if practicable. During the operation of budding keep the shoots in a jar of water, previously cutting off the leaves but retaining about half an inch of the leaf-stalk so as to obtain a firm hold of the bud. Insert the knife in the shoot about one inch above the bud as at B, Fig. 1.

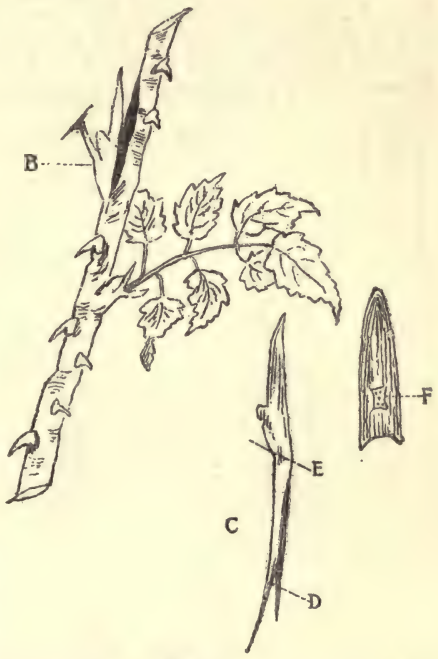


FIG. 1.

Cut thinly under the bark and when past the bud rend it off. It will then appear as C and D, Fig 1. Hold the bud between the thumb and finger of the left hand, and with the point of the knife lift up the small slice of wood attached to the bark and jerk it out. As a rule it

comes out easily enough, leaving the germ of the bud intact. If this germ is missing, and there is a hole about the size of a pin head under the bud, it is waste of time to insert the bud. Some varieties behave in this way and must be cut rather thinner than others. Before cutting off the bud wipe the stock clean and make a cut upwards, and then crosswise in shape like the letter T (see Fig. 2, A B). Do not cut so deeply as to injure the wood of the stock. Raise only the bark gently on each side of the long cut by inserting the bone of the budding knife. Then insert the bud at C and gently push it down to the end of the cut D. Many budders dispense with the cross cut, but it facilitates the insertion of the bud. When the bud is placed in position cut off the surplus piece of bark and bind up the wound tight (see E, Fig. 2) with raffia. When the soil is free from insect pests draw up some of the finest mould to the bud so as to quite envelop it. This is essential in a dry season. A month after budding remove the soil, examine the bud, and if found alive (which can be easily seen from where the leaf-stalk was attached, but which has now decayed), return the soil again and leave it until spring. Do not touch the tops of stocks until after the leaf has fallen, and not then unless they are wanted for cuttings. The time to remove them is in February. They are then cut quite away to within an inch of the bud. Seedling briars are budded in the collar, that is, the thick root immediately below the branches.

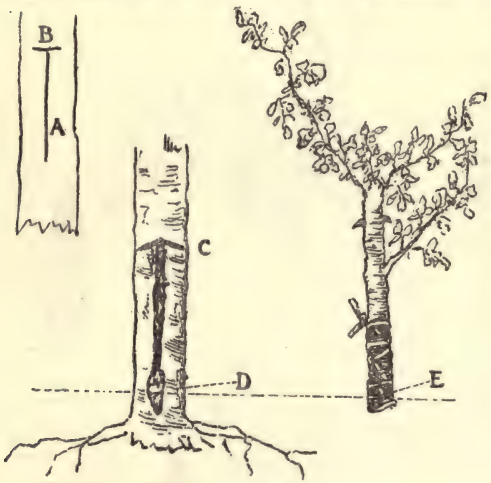


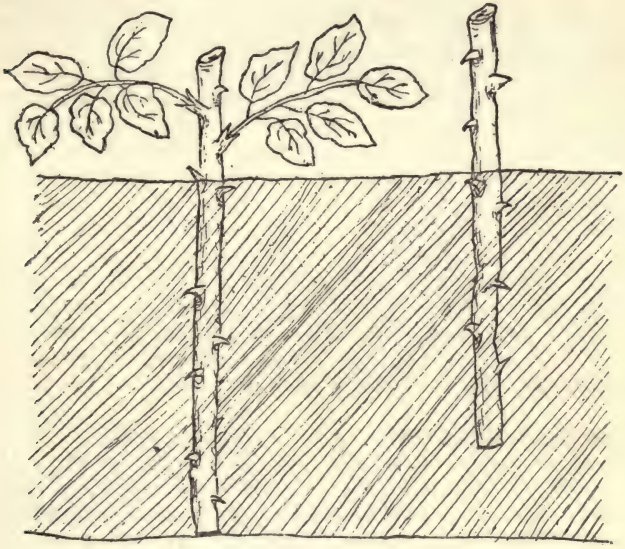
FIG. 2.

Budding Standard Briars.—These are budded in the best lateral growths, but close up to the upright stem two or more kinds may be budded on one standard, but they should agree in growth—for instance, La France (pink) and Alfred Colomb (red) would associate well together. In the case of the standards remove the raffia after the fourth week, but do not cut away any of the growths until February. When the buds start out (as they often will and blossom), leave them until autumn, and then cut back to one eye. Retain the raffia on dwarf stocks; the soil will rot it off before February.

Propagating by Cuttings.—There are many different ways of striking Roses from cuttings, but the best one for the beginner is as follows:—Early in September a piece of ground in a sheltered part of the garden, but not necessarily under a north hedge, should be deeply dug, or, better

still, trenched. When gritty material, sand, burnt garden refuse, &c., is at hand intermix this with the soil, unless the latter is sandy. Whilst this soil is settling down make the cuttings from growths that bore the first or summer flowers. Where possible they should have a heel, *i.e.* a piece of the old stem attached.

The cutting may be of any length, but five to six inches is about right. Smooth over the heel with a sharp knife, remove all foliage save the topmost leaf-stalk, but do not cut away any leaf-buds. The cutting is now ready for planting. Where a heel cannot be secured, cut the end just below an eye or leaf-bud. The wood must be quite hard.



AUTUMN ROSE CUTTING PROPERLY INSERTED IMPROPERLY INSERTED

As the different kinds are made, tie into bundles, and lay them in boxes of moist sand or soil, and keep them in a shed. When all are made they should be planted. Take out a trench of the prepared bed one foot wide, and the depth of a spade. Cut down a wall of soil as perpendicular as possible. At the bottom of this wall of soil put an inch of sand or old cocoanut fibre, then stand the end of the cutting on the sand, and lean them against the wall of soil, the cuttings being about one and a-half inches apart or more, if there be plenty of room. Many prefer to dibble the cuttings in with a dibbler, which is often disastrous, as the cuttings hang, *i.e.* do not touch the bottom of the hole. It is much better to dig the ground as advised. When the row is completed, gently place half the soil to the cuttings, then tread firmly with the foot,

the remainder of soil being returned and made firm. The cuttings should not be out of the ground more than an inch, but this is not material so long as they are in the ground to a depth of five inches. When the row is completed, more ground is dug, and another row commenced about twelve inches from the first. After a hard frost the cuttings are often by its action raised out of the ground and left hanging. As soon as frost has gone go over the cuttings, and push them down. It may be necessary to do this two or three times, but if neglected for long success cannot be expected. Subsequent treatment consists in keeping the surface soil loose for about two inches, and in the following spring twelvemonths, that is about eighteen months after planting, the cuttings should be transplanted to their permanent position. When doing this, place a little very fine soil near the roots, which are so fine that in heavy soil they do not start properly. The majority of Roses will strike readily from cuttings, but will not all be in fit condition at one time. Do not attempt to strike any from the first lot of plants, for the wood you would use is of great value the second season for flowers. Plants three years old will provide plenty of useful cuttings. There are other ways of making Rose cuttings, the next best to the above being from the growths of pot-grown plants in March or April. If a variety is scarce, one eye or leaf-bud is cut off and stuck, with leaf attached, round the side of a three and a-half inch pot of sandy soil. A cutting with two eyes and both leaves attached, however, is preferable, but remove the end leaflet, and plunge the pot in cocoa-nut fibre in a cucumber or melon frame. Place a small bell glass over the pot of cuttings, and freely sprinkle the foliage. It is most important to well preserve the foliage, and, of course, when inserted the cutting should be clean and free from insect pests.

Protecting Rose Blooms.—Even the beginner, if he grows a fine rose, wishes it to last as long as possible, and develop to its utmost beauty. With some of the Tea and light-coloured Roses, shading of the flowers is necessary. Zulu straw hats fastened on sticks are as good as anything, or a frame of wire can be made cheaply to support a piece of calico. Even a flat piece of board tacked on a stake will keep a flower clean, and not exclude the air. High-coloured Roses should not be shaded.

Treatment after First Flowering.—Go over the plants that are autumn flowering, remove any crowded growths, and those that have flowered, unless the flower has been cut with a fairly long stalk, should be cut back a few inches to a dormant leaf-bud looking outward. A better second growth is secured, and it does no harm to next season's blossoming. It is a great strain upon a plant to allow it to seed. As the flowers die off, cut back the growth at once, instead of allowing the seed-pods that appear at the base of the flower to develop.

Pests, Insect, and otherwise.—Caterpillars and green-fly are the worst insect pests. There is nothing better than hand-picking for the former. When two leaves are stuck together, or rolled up, a fat maggot will be found. Pinch the leaf, and this will settle the marauder. Constant watching is necessary. Do not let two days go by without looking over all the plants. Many a flower is injured through neglect of this pre-

A BED OF STANDARD ROSES.

caution. When pruning is carried out as directed, and the plants relieved of much old wood, the eggs of these caterpillars will depart also. Green-fly will not trouble those who keep their Roses thoroughly healthy. They do not like the sap of healthy plants as a rule, it is the weakly growths they attack. Good syringings of cold water dislodge many, and it is a good plan to dip the ends of the young shoot when covered with green-fly into a vessel of strong tobacco water or quassia chips solution.

A good recipe for quassia chips solution is as follows :—Take four ounces of quassia chips, steep them in water for a few hours, then simmer from twelve to twenty-four hours in a gallon of water, and add three ounces of good soft soap. When dissolved, add water to make up two and a-half gallons. Green-fly upon Roses under glass can be readily exterminated by fumigating. M'Dougall's tobacco sheets are the simplest remedy. One or more, according to cubic measurement, are hung in the house, and set alight. They gradually consume, and not a fly will be found the next day. Richards' XL All is too well known to describe; it is an excellent remedy.

Red spider is often very prevalent on Roses under glass. Want of syringing and too dry an atmosphere cause it. The leaves turn yellow and drop off. With a magnifying glass the pests may be seen running about on the under side of the leaf. The same fumigation will check them, but syringing well the under side of the leaves is the best remedy.

Mildew is a troublesome fungus. It inflicts considerable injury by choking the breathing pores of the foliage, and consequently growth is hindered. When a plant is badly attacked, the latter has the appearance of being dusted with flour. It makes its appearance under the leaf as well as on the surface. A thoroughly good dredging with black sulphur, underneath as well as on the surface of the leaf, will check its ravages. Put some sulphur in a piece of cheese-cloth made into a bag, and thoroughly dust the foliage with it. After remaining on for two days, syringe off and give another dredging if needful; this should be done on a quiet evening, when the foliage is slightly damp. It is a mistake to wait until the plants are badly attacked, but as soon as a few spots appear, press them with the thumb and finger, previously dusting or dipping the thumb and finger into some sulphur. Mildew is the result of a check of some kind. Out of doors one cannot quite avoid it, but never let anything, if possible, check the young roots, such as strong liquid manure. Indoors one is troubled most with mildew. In starting Roses into growth, do so gradually, then the foliage becomes as it were hard, and can stand a little cold. Give them, however, very warm treatment at the start, so that the growth is tender, and the first cold wind, or too much air, will bring about mildew. Cold winds blowing immediately on the foliage are fatal. Soot is a good remedy for mildew if applied carefully. It should be some months old, and must not remain on the foliage more than two days at a time. If the tiny white spots of mildew are dusted with sulphur when first observed, the plague is checked.

Red Rust or Orange Fungus is another troublesome fungus. It

forms on the shoots like knots of powder, and is of a rich orange colour. Go over the plants, and pick off and burn the leaves thus troubled. There are other pests, insect and fungoid, but the above are the chief.

THE TEA AND HYBRID TEA ROSE

The Tea Rose is queen of the Rose world, and the hybrid Tea is almost as delicate in colour and in form. During recent years many beautiful kinds have been added to our collections, and this raising up of practically a new race has altered in no small degree the complexion of the English garden. A group of Edith Gifford, or of Viscountess Folkestone, upon the lawn is a joy, if not for ever, at least from the time the crimson shoots appear through the soil until the last flower has faded in the cold dark days of late October; and when the weather is fine in the autumn and early winter flowers may, in sheltered places, be gathered even at Christmas. A well-drained soil is most suitable, and always select a sunny aspect, although the plants are a success in a north border, the flowers appearing later. The finest flowers are produced upon standards or Tree Roses, but they are more troublesome to manage. Most of the Tea varieties and hybrids may be grown as bushes budded upon the seedling briar or struck from cuttings. The plants should be kept growing by hoeing and watering freely. Tea Roses are excellent for forcing, providing lovely button-hole flowers as well as long stemmed blooms for table or vases. Protect the bushes in winter by earthing up the base with burnt earth or ordinary mould. Then put some fern from the wood among the branches and they will be secure for the winter. Commence to cover up in November and keep soil to the base until April, but the fern should be removed now and then during mild intervals. If flowers of high quality are desired prune hard each year (in April), but if profusion then merely remove unripe ends of growths and keep the centre open.

Walls for Tea Roses.—Every advantage should be taken of walls and close-boarded fences for the beautiful Tea Roses. Unless the walls are very high do not plant the usual so-called climbing kinds. Varieties known as the strongest dwarf growers are the most suitable. Trench the ground, plant in autumn, and prune very sparingly. Thoroughly soak the plants at the roots now and then with water. Twelve excellent kinds for this purpose are Anna Olivier, Mme. Hoste, Comtesse de Nadaillac, Niphetos, Mme. de Watteville, The

SPRAYS OF ROSE, DUNDEE RAMBLER

Bride, Bridesmaid, Maman Cochet, Marie Van Houtte, Mme. Charles, Mme. Lambard, and Mlle. Abel Chatenay.

Hybrid Perpetual Roses.—This famous group of Roses has its origin in the Damask Perpetual which was crossed with the Bourbon, Hybrid Chinese, and other closely allied kinds, and all the varieties have been raised since the year 1844. The h.-p.'s, as rosarians called this class for the sake of brevity, are more in request to give those beautiful flowers seen at the exhibition, perfect specimens of form and colour, but not always so perfect or desirable in the garden. There is no question that the hybrid-perpetual is for the garden doomed to partial extinction through the raising of so many charming Tea-scented flowers, brilliant China, or Monthly Roses, flowers far more worthy of the name perpetual than those so christened, possessing also greater delicacy of colour and form. But we hope the day is far distant when the hybrid perpetual Roses, flowers of intense colour, deep crimson, pink, rose and white, and many other shades, and filled with richest perfume, will disappear. We have need of them.

Standard Roses.—When these are desired the planter would do well to select them from the hybrid perpetual race, except a few from the climbing Tea-scented and Noisette sections to vary the colouring; but, as a rule, bushes or "dwarfs" are the most suitable for the beginner. The hybrid perpetuals are easily produced by budding or from cuttings, which are called "own-root" plants. Four stocks are usually employed, however: cutting and seedling briars, the Hedgerow Briar, for the formation of standards, and the Manetti, which is the worst of all stocks for the garden; it is necessary for the exhibitor, because it promotes large and early flowers. It may be interesting to mention that when the soil is heavy loam the briar-cutting should be used. A deep clay is suitable for the seedling briar. Some kinds are excellent for bedding if a brief display will satisfy. They are excellent Roses for pots, and should be grown thus in cold frames.

Climbing Roses under Glass.—Climbing Roses succeed best when they can receive plenty of heat and moisture after flowering the first time to perfect new wood for the following season. The old wood is partially cut away when the flowers are gathered, and by giving heat and moisture fine new rods are produced, which should be well ripened. Climbing Roses also succeed well if the long growths produced the previous summer are bent down on a framework of wire or wood about a foot from the side benches. A flower-bud, with of course a short stem, will start from nearly every one of the eyes. After flowering cut the shoots back hard to promote fine long rods early in the year. This is only possible where artificial heat is available. Unless that is so it is better to leave the growths unpruned and thin them when they become crowded or too old, merely shortening the laterals to one or two eyes.

Marechal Niel Rose under Glass.—This glorious Rose deserves

a house to itself, but this is seldom possible. It must be grown with a variety of greenhouse plants. The three points essential to success are: a good border; a healthy plant, well rooted, and young; good annual growths thoroughly hardened.

A Good Border should be made inside the house. Prepare it as if for a Grape Vine. Remove the old soil to a depth of three feet; put about nine inches of drainage in the bottom, consisting of clinkers, large stones, or broken bricks. Then fill up with a compost of three-parts fibrous loam, one-part cow dung, and a six-inch pot of bone-meal to each wheelbarrow-load of soil. When the loam is obtained fresh from a meadow put the turfy portions with the grass side downwards. This work should be done some five or six weeks before planting time, which is for preference in October.

A Healthy Plant.—The best stock to grow Marechal Niel upon is a hedge briar, known as a half-standard. The briar may either be planted first and budded afterwards, or a plant procured already budded. When the latter, see that it has an abundance of fibrous roots. When this is the style selected, prune its growths back to within an inch or two from where it has been budded. This can be accomplished about January or February. Do not give too much heat at first. The slower the new growths break the better, and as they grow, train them horizontally. If the plant is put on one side near the centre, one growth would be trained to the right and one to the left. These would probably reach further than the ends—if so, do not prevent them. Pinch out the points in September to help the shoots to ripen. These two arms provide, as it were, the limbs for the base of future shoots. The following spring, retain the growths of the same length as the house is, then, as the new shoots break out, the best are led up the roof and tied to wires. More shoots break out than are wanted; the best only are retained, and, as far as possible, at even distances apart, say about one foot. Suppose the roots work freely, these shoots will go up the roof on one side and down the other. They must be stopped in autumn, but not too early or they will break out into growth again. The object is to get them thoroughly hard, for it is upon these that the flowers appear, and if they are good, strong, hard growths some noble blossoms will result.

Now comes the question of the rods for future requirements. After flowering cut the canes right back to the two main arms, and again the latter send out new shoots, which will require thinning as before. After flowering maintain a good heat, and freely syringe the plants before eight o'clock in the morning, and after four o'clock in the afternoon. The border must not be neglected, but usually one or two good waterings suffice, with an occasional dose of liquid manure. Before doing so prod the soil with a fork. This, then, is the best plan of growing Marechal Niel Roses.

But it may also be grown in a cold-house. Here again we advise half-standard plants, but they must not be pruned back so hard, as artificial heat is not available. Keep the growths well spread out, and weak wood thinned out. Remove old shoots now and then, and retain as much new wood as possible.

HYBRID TEA ROSE VISCOUNTESS FOLKESTONE.

Amateurs would find this Rose profitable to grow, especially if retarded so that the plants flowered about the end of May and early June when Roses are scarce. This can be done by pruning late and keeping air in the house night and day. We have seen the door made in two sections so that the lower half is kept always open, thus allowing a current of air to enter without a draught being caused.

Preparing a Border for Roses under Glass.—Allusion has been already made to this work. When it is decided to plant out all Roses (and we strongly advise this) prepare the border in the same way, even for dwarf growers. Roses glory in good loam, but they detest stagnation, hence the need for drainage either natural or artificial. An investment in two or three cartloads of loam will well repay the grower of indoor Roses.

Roses in Small Greenhouses.—In a small structure where other plants are grown, Roses should be in pots or tubs. If there are no cold draughts the hardier section can be cultivated. Such plants as have been grown for twelvemonths outdoors in pots are the best for the beginner. The pots are full of roots, which is the main secret of success. Supposing the beginner wishes to grow a few pot Roses let him either purchase established plants in six-inch or eight-inch pots or bushes in October and pot them up himself. Prepare some compost in September, and this should consist of three-parts loam, one-part well-rotted manure, preferably from the cowyard, not fresh but one year old. Then add a little artificial manure at the rate of a six-inch potful to a wheelbarrow-load of soil. Mix all well together, and let it remain in a rain-proof open shed until required. When plants are received in October, cut off all foliage, trim back the growths to one and a-half to two feet, shorten the roots a little, and smooth off jagged ends, and they are ready for potting. Keep them in the shade until potted. Prepare some eight-inch pots by washing them clean inside and out, place about one and a-half inches of drainage in bottom, and a little well-rotted manure over the crocks. Take the plant in left hand, carefully arrange the roots to prevent cramping, and with a wooden trowel place some of the compost among the roots. Ram the soil about the roots firmly with a potting stick, then put in some more soil, give another ramming, and the operation is complete when the soil reaches the rim of the pot. Keep the tops well syringed, but do not water the roots for a day or two, and then only give one good watering. Plunge the plants in some ashes outdoors unless a cold pit is available, then it is better they should be kept in this, with the light off, unless frost or heavy rains intervene. Prune the plants in February, cutting them back to four or five inches from the top of the pot. Keep lights off on mild days, but put them on every night. Neither let the soil get quite dry nor over water. As new growths appear keep the plants well apart, and fumigate with tobacco sheets when green-fly is seen. It is not necessary to keep the plants in pits, but it is advisable, as then one is able to prune earlier without danger of new shoots being injured. Simple pits may be made with turf walls, and any handy man can make a light, or the parts can be purchased and nailed together. By May there will be fine flowers on these plants. Plunge outdoors in full sun

for the summer, and in autumn they may be introduced to the greenhouse. Pits with a southern aspect will grow Roses quite as well as a greenhouse; in fact, they would be better if it is necessary to have other plants too. Give a top dressing the first year, not repotting. This is accomplished by scraping away about an inch of the surface soil; scatter a tablespoonful of guano on the soil, and replace the soil removed with some fresh loam. If a Marechal Niel or other climbing Rose is desired to grow on the wall or roof of the greenhouse, either plant it in a large pot or tub, unless a small border can be prepared for it, as advised under heading of "Marechal Niel under Glass." If in pot or tub, give plenty of drainage, and raise it upon two or three bricks, so that water can pass away freely and also air enter the soil.

Climbing plants known as "extra sized" in eight-inch pots are the best to secure. For very small houses it would pay the grower to renew the plants annually, for the nurseryman has better facilities of growing this class of Rose correctly. When purchased no pruning is necessary; save the extreme ends of the growths, for the stems should be well ripened and in condition to produce a number of fine flowers the following spring. Unless these climbing Roses, especially Marechal Niel, can be made to yield new and strong annual growths they soon deteriorate, hence the advice to purchase annually, for they can be secured for two or three shillings, and the flowers they yield would realise more than this at wholesale prices.

Potting Roses.—Roses forced in strong heat should be repotted in July, and those grown in cool house in September. The pots and crocks should be clean and pot firm; the soil must not be too wet or too dry. Give ample drainage, and do not sift the soil, as Roses like the little lumps of loam. The best compost consists of three-parts loam, that which has been stacked twelve months, if one can obtain it; one-part one-year-old cow manure; and either a six-inch potful of guano or the same of steamed bone-meal. When about to pot, turn out the plant, lay the ball on its side, and remove the crocks. Then with a pointed stick go all over the ball of earth, and gently prod it. This releases the roots, and some of the soil at the same time. Then take the mass in both hands, and shake gently. Place it carefully in the centre of the pot, and fill up with compost, ramming this hard in. The pots must not be filled too full, merely to the rim. Place the plants on a bed of ashes when potted, and keep them here until wanted, unless frosts or heavy rains intervene.

Pillar Roses.—For many varieties of Roses the columnar, or pillar form, is the most natural as well as the most attractive. A pillar, say of Crimson Rambler, well isolated upon the lawn, its fine growths darting out here and there to relieve the pillar of formality, is, when aglow with its crimson panicles of blossom, a gorgeous picture. By selecting the freest growers, and placing the pillars some twelve to twenty feet apart, and connecting each by chains hung loosely, a pretty effect is produced when the growths are sufficiently developed to drape the chains with blossom. For this purpose, what are known as running Roses, are only suitable. Here the new Wichuriana will prove

PEGGED-DOWN ROSES.

useful. Old kinds, such as Flora, Aimée Vibert, the Garland, Dundee Rambler, Ruga, &c., are also good. For pillar Roses, four-pronged iron stakes should be used, if possible, unless some stout larch poles are available. As Roses of this kind are often fixtures, trench the ground well before planting, working in some good manure and burnt garden refuse. Place the stick in position before planting the Rose. Early planting is advisable, and in all cases pillar Roses should be cut back rather hard the first year, say within two feet of their base, or even lower would be better. The growths that result from this pruning are then retained their full length another season. When the plants become filled out with wood or growths, two or three supplementary stakes placed around, as one would tie out a Dahlia plant, prevent overcrowding. It is when such pillars are bunched up that insect pests become a great trouble. As the pillars develop, old worn-out growths should be cut clean out, and the healthy one, two, and three-year shoots only should be retained, and not all of these if likely to crowd too much. The lateral shoots breaking out from the main growths may be cut into three or four eyes, or left longer. It is generally from these laterals that the best blossoms are procured. Pillar Roses should receive liberal doses of liquid manure.

Creeping Roses.—Sloping banks are not generally suitable for trees or shrubs, but by planting such things as creeping Roses on the top, and allowing them to run down the bank, much beauty is given to the garden. Now that we have the delightful and valuable *Rosa wichuriana* and its hybrids, one need not look further for suitable kinds. They will doubtless soon be available on their own roots. The type will make yards of growth in a season. In August it is bespangled with delightful star-like white flowers, and its small shiny foliage has a most refreshing appearance. Jersey Beauty, Ruby Queen, Evergreen Gem, Universal Favourite, and Pink Roamer are all worthy kinds, and most luxuriant growers.

Pegging-down Roses.—This is a first-rate method of growing the vigorous Roses. Plant them from two feet six inches to three feet apart; prune hard the first year, then the following year tie down the long growths parallel to the ground. Flowers will appear along the shoots. Later on young growths start up from the base, and, if allowed to grow upright, will bloom about a month later than the pegged-down shoots. When the long shoots appear worn out, cut them clean away, and peg down young ones instead; but they will usually last two or three years.

Beds of Roses so treated make a fine feature on a lawn, such kinds as W. A. Richardson, Allister Stella Gray, Gustave Regis, and others, blooming most profusely, as will also strong-growing hybrid perpetuals and Bourbons.

Roses for Hedges.—In small gardens it is better to plant hedges, where required, of some good shrub that will serve as a dividing line, and give an abundance of flowers too. For this purpose nothing can be better than the Rose. Given good soil, deeply dug, with a good dressing of manure when preparing, and also yearly afterwards, vigorous

hedges may be produced. Plant the bushes from two to four feet apart, according to whether a thick or thin hedge is wanted. Where a wall of Roses, rising some eight feet to ten feet, is preferred, rambling Roses would be best. Secure in the ground at intervals of six feet or eight feet some good, stout oak posts. Stretch some wire in between them, to which fasten the Roses. By bending them out palmate shape a pretty effect is created.

It is not possible to get a safe shelter with the help of only Roses, but certainly they may be used as a screen. Where the position is cold and exposed, an outer belt of Austrian or Corsican Pines, or some other good tree, would be necessary. A free growth, of course, is essential.

Preparation of the Soil is important. Most soils are improved by draining. We know that the wild Roses grow vigorously in country hedgerows with dykes on either side. If the staple soil is a heavy clay, before planting a hedge put down some drain-pipes about two feet six inches deep. If a clayey loam, then about three feet. The ground should be trenched two spits deep for the heavy soils, and bastard trenched for those of a lighter nature. Good, well-decayed farmyard manure, together with burnt garden refuse and bone-meal, all favour a vigorous growth in the hedge. Rather than make the soil sour by too much raw manure, give liquid manure liberally, not only in summer, when growth is active, but also during winter, when usually this valuable liquid runs to waste.

Most of the kinds recommended will in time support themselves; but if a tall hedge be desired, set some oak posts in the ground at intervals of from six feet to eight feet to support two or three lengths of wires. Galvanised wire must be *painted*. Give the plants plenty of space to extend laterally, so as to secure robust base-growth.

Rose hedges must be pruned to promote an abundant flower display. The way to prune will depend upon the variety. Avoid, of course, any trimmed-up effect. The branches should droop with their flower burden. Growths one and two years old produce the finest flowers, and on some kinds laterals appear from three- and four-year-old wood. One or two branches may be cut out of each plant so as to give those remaining more space for development. This pruning may be carried out in the autumn; it is a better time than the spring.

With regard to the stock, secure, if possible, strong own-root plants. If this cannot be managed, then get them upon the seedling briar, the roots of which go down deep, and the plant is then better able to resist drought.

The Sweet Briar is of course the hedge of hedges. Pleasant is it to wander round the garden in the clear light of a June evening when the air is saturated with the perfume of the Sweet Briar, fresher and sweeter still when the day has been warm and moist. Many of the Penzance briars are almost as sweet, and are now largely used as hedges. Unfortunately the flowers are quickly over, but they welcome us in the early summer, and in the autumn we have in their place a harvest of bright fruits, especially upon the one named Amy Robsart. The

Penzance briars are remarkable for the brilliant colouring and profusion of their heps. There are not many truly distinct kinds, as a family likeness runs through them all; but Anne of Gierstein, or Meg Merrilies, deep crimson; Amy Robsart, pinky-white; and Lady Penzance, with copper yellow flowers of great beauty, are the most useful.

Several single Roses are of value, some for their richly coloured bark in winter, others for their heps. *R. lucida*, *R. polyantha Thunbergi*, and *R. rubrifolia* may be mentioned as the most suitable.

The Japanese Roses are, perhaps, apart from the Sweet Briar, the most useful of all Roses to make hedges of. The plants make a dense prickly growth, and are beautiful practically the whole year, and fragrant and showy flowers and large, crimson fruits are produced at the same time. The plants are apt to become bare at the base, but not so if pruned in the way advised.

Hedges round a Lawn or Flower Garden.—When a dwarf hedge is desired, and nothing can be sweeter than Roses round a tennis court or lawn, choose first the Monthly or China Roses. When finer individual flowers are preferred, place faith in the Tea and hybrid Tea kinds, such as Mme. Abel Chatenay, Caroline Testout, Viscountess Folkestone, Marie van Houtte, Mme. Lambard, and Grace Darling, all Roses that will grow between four feet and five feet in height. A dense hedge may be formed with the early-flowering Scotch Roses and the single kinds of the same race.

Selections of Roses.—As complete selections of Roses as possible are given in the chart, bearing in mind the readers for whom this work is chiefly written. It is therefore needless to repeat them in this chapter.

China Roses.—Although the China or Monthly Rose has many delightful attributes, it is by no means present in every garden; indeed, one may go through many and never see it at all. Some one who truly loves good garden plants says: "If I had only one square yard of garden it should have a bush of Rosemary, but if I had a yard and a-half it should have a Rosemary and a China Rose." It is, indeed, a delightful flower this common old kind, with its loose clusters of cool pink bloom, sometimes cup-shaped and sometimes flattened from the slight reflexing of the fully expanded petals, always dainty and pleasantly fresh-looking, and with a faint and tender scent whose quality exactly matches its modestly charming individuality. There are garden varieties of deeper colour, but these seem rather to lose the distinctive grace of the type; it is one of the cases, of which others might easily be quoted, where any departure from the type gives varieties that are a loss rather than a gain to beauty.

If proof were needed of the merit of this good plant it might be found in the many ways in which it can be used. A hedge of China Rose is always pretty, and there is a certain class of greyish foliage with which it enters into most satisfactory combination. The cool dusky foliage of Rosemary is the best of grounds for the clear pink flowers and the grey of Lavender is equally pleasing. Old Lavender bushes that are somewhat overgrown, and whose branches fall about, leaving dark empty spaces in the heart of the bush, seem to invite the companionship of these pretty pink Roses, whose flowering branches can be led into the empty spaces. Even if it be desired to do away with the old Lavender, whose lifetime is shorter than that of the Rose, and to plant them afresh, that is only an opportunity for cutting the Roses down and letting them grow up anew in company with the young Lavender.

But it is not with grey-leaved shrubs alone that China Roses should be planted. Their fullest season is towards the end of June, but even as late as October they are fairly full of flower. The flowering bush Ivies are then in bloom, and on sunny days attracting a busy humming crowd of insect life. Here again the pretty pink of the Rose bloom is charming, with the yellow green of the Ivy clusters, and as the Ivy bushes grow to their full height of five feet or six feet the Rose shoots up in friendly companionship and thrusts long flower-crowned stems through the mass.

With the *Anemone japonica* it also groups well, or with hardy Ferns, and makes good autumn garden pictures. No Rose is more accommodating, for it will bloom either in sun or shade.

Of late years the China Rose has been wisely used by hybridists, whose labours have given us charming Roses that inherit the long-blooming qualities of the parent.

GREEN CENTRES IN ROSES

Beginners are often perplexed as to why their Roses should come with green centres. The most common cause of this troublesome occurrence is spring frosts. At pruning time, especially when the season is early, one is tempted to leave young promising growths, but unfortunately the frost comes and so injures the embryo buds that these green centres are the result. Another cause is over-feeding with chemical manures. The remedy in both cases is obvious.

WORK MONTH BY MONTH

The Rose is a flower so popular and beautiful that the work required amongst the plants month by month will prove helpful to the beginner.

JANUARY.—On established Rose-beds strong liquid manure may be poured. Standard briars may still be planted if weather is mild. Indoors, the borders or large tubs of permanent Roses should receive a top dressing. Remove two or three inches of the old soil, scatter on some good artificial manure, then replace soil removed with fibrous loam and well-rotted manure in equal parts. If borders are dry, give a good watering first.

FEBRUARY.—If farmyard manure be applied to the beds this should now be dug in. Do not dig very deeply, just enough to bury the dung. The surface of the Rose-beds should also be loose. This is not a hard matter to secure if the hoe be diligently used. Planting may still be done if mild and dwarf stocks for budding should now be set out. The stocks are better headed in, for the frost only draws them out of the soil and practically kills them. So when cold weather threatens wait for milder days. Give the beds of established Roses a dressing of manure; keep the surface soil loose so that rains will wash down the nutriment. If the appearance of manure is objected to cover it with soil. Artificial manures are essential to develop good blooms. The cheapest and one of the best for this purpose is basic slag, which should be applied early in winter at the rate of four to eight ounces per square yard.

Cuttings inserted in autumn will require pushing down, as the frost usually raises them, and unless their ends rest in the soil failures will occur. Hoe the cutting beds when necessary. Pruning should be done now to plants upon walls; this will merely consist in tipping the ends of shoots, for the thinning should have been done in autumn. Release the growths from the wall to retard them as much as possible. If they break too early much disappointment occurs through injury by spring frosts. Hardy Roses, such as Mosses, Gallicas, &c., may now be pruned. Budded stocks should now be cut back as far as the inserted bud. After this cutting back, the soil is then dug thinly and laid up as rough as possible to sweeten. Any old bush Roses one does not care for, if cut down to the ground, may be rebudded in July with good kinds. Where one desires to layer some Roses, hard pruning should be done now. Give new stakes to standard and pillar Roses before March winds arise.

Roses under glass will require much attention. Keep the soil rather dry until new growths are about one inch in length, then give plants a good watering with tepid water. It is best to repeat the watering the next day in order to thoroughly soak through the ball of earth. Put the plants upon inverted flower-pots on two bricks. Fumigate whether fly is seen or not. The Rose-house should receive a dressing of lime-wash upon any brick work inside. Paint the hot-water pipes with black sulphur. If some skim milk is mixed with the sulphur the latter

adheres to the pipes better. Do not give side ventilation to pot Roses, but top air on all suitable occasions. If the sun is bright forestall the rapid rise of temperature by timely ventilation. Shut the ventilators about three o'clock. Pot Roses revel in the sun heat thus enclosed. Syringe the plants every bright morning with *cold* water. Endeavour to harden the foliage so that it will withstand the mildew which often causes so much trouble. Sudden risings or lowerings of temperature as well as cold draughts bring mildew quicker than anything else. As soon as a spot of white downy substance is noticed rub it with finger and thumb dipped in sulphur. If bad attacks of mildew should appear syringe the foliage with sulphide of potassium with an Abol syringe, or use "Abol." The quantity to use is a quarter ounce of the sulphide to one gallon of soft water. Prune Roses in cold pits.

MARCH.—Planting may yet be done, but, if dry, water frequently. The plants should also be hard pruned before planting. Cut Tea Roses back to three or four inches or less. They are sure to grow well if roots and growths are healthy. Pruning should be finished by the second week. In the north the third and fourth week will do. Prune all now except the Teas, Polyanthas, Noisettes, and Chinas. After pruning dig the land thinly. The best plan is to lightly prick it up with a fork. On no account dig deeply, for the feeding roots run close to the surface. If ground has been well prepared avoid mulching beds with manure, as this mulch shuts out both sunshine and air. Mulchings are only beneficial during hot days when plants are growing fast, and a good loose blanket of earth is better than all the mulchings with manure. Dwarf stocks for budding should now be planted. Where the pegging-down system is adopted with vigorous growing Roses, some of the ripest and longest growths should not be pruned. Do not, however, bend them down until April.

Indoor plants showing buds may have weak liquid manure twice a week. A layer of fresh cow-manure is also of much benefit if applied to the borders now, or to the surface of the pots. Do not allow the temperature of the forcing-house to fall below 55 degrees at night. Where Roses are grown without artificial heat by day, provision should be made to afford a mild amount during the night. A little heat about ten o'clock at night to such houses will suffice. This will prevent the temperature declining below 45 degrees. It also wards off injury through a stagnant atmosphere. No doubt Tea Roses are best grown quickly, so that if no heat or very little be available it is wise to cultivate the hybrid perpetuals and the freest of the hybrid Teas, for they can endure a lower temperature than Teas. By the end of the month the soil around the Teas outdoors may be removed, and also the litter from heads of standards and bushes. Keep lights on the Roses in cold pits every night, but remove by day unless very cold winds prevail.

APRIL.—Tea and hybrid Teas, Chinas, and Polyanthas, if planted late, will give a succession of blossom when the established plants are over. Procure dormant plants, viz., those that have been healed in under north hedges or walls. Dip their roots in mud-soup before

ROSE. DOUBLE PERSIAN YELLOW ON EDGE OF WOOD.

planting, and prune back hard all the growths. Tea Roses and allied tribes may now be pruned. Remove earth from budded stocks, and place a stick against each, in order to tie the bud securely as it grows. Budded standard briars should have a thin stick tied on the upper part of stem for a similar purpose. Keep the hoe frequently used now among all Roses. Scatter soot on land and hoe it in. This is beneficial to Roses, and wards off insects and fungoid troubles. Water newly planted Roses. Climbers under glass as they go over may be pruned. Marechal Niel if cut back to about three or four feet from the base will be induced to make new shoots which will give the best flowers next year.

This is an excellent time to plant out own-root or cutting Roses from pots.

MAY.—Insects will now prove troublesome. Go carefully over the plants and give a pinch where the enemy appears to be hiding. Disbud growths on the plants. Rub off the supernumerary shoots in the centre of the plants. Two or three of the best on each growth will suffice. Liquid manure may be given now about once a week if weather be dry, but first apply plain water. If the season be wet, a sprinkling of artificial manure will be more beneficial. Sometimes bad frosts occur this month. Wall Roses pay for a mat hung over them each night till danger is past, which is in about the last week. Wall Roses also need a good soaking of water now and then. Like wall-fruits they often are neglected in this respect. and really need it most. Hoeing is an important operation. A sprinkling of bone-meal is helpful; keep it well hoed in. Suckers must be cut away as they appear. Standard briars for budding must have their shoots thinned. Retain three or four at the top or lower down if stronger.

This is a good time to put in cuttings in a greenhouse. Select shoots that have flowered. Cut them in lengths of four inches to six inches or more, remove lower leaves and dibble into very sandy soil, or all sand may be used. Place a large cloche or bell-glass over them, and keep the cuttings lightly sprinkled each morning. Shade from midday sun. Wipe the glass every morning. In about five weeks the cuttings may be potted off into four-inch or five-inch pots. Keep them in a close frame for a few days after potting.

Tea Roses in pots after flowering should be rested for a time by partially withholding water. Shorten the growths a little to good plump eyes. When buds are again active give the plants water and syringe now twice a day. Air must be more plentifully afforded, and a little let in at night. Hybrid perpetual Roses after flowering should be plunged outdoors. Stand them on ashes or two bricks and surround the pots with ashes or soil.

Green-fly or aphis will now be troublesome. As a rule, it is generally upon Roses not growing freely or in an unhealthy state. A good remedy is to dip the shoots covered with the aphis in tobacco water. Put one pound of tobacco paper into one gallon of boiling water; when steeped well, add one gallon of soft water. Keep a stock of this, and go round the plants and drench the shoots with it.

JUNE.—Any gaps in Rose beds may be filled up with plants from pots. Those potted in October are best for the purpose. Make a hole for them, turn the plant out intact, and carefully set it in, then fill up with soil. Tread carefully around the ball of earth so that it be not broken. If no check be given, such plants flower well by the end of the season. To old-established Roses in the best condition, applications of night-soil and sewage are beneficial, but must not be given to weakly plants. Draw a drill down the centre of the row between two rows of plants, pour the night-soil in, and return soil. Rains soon carry down the food, and a marked difference is manifest in foliage and blossom. Disbudding must now be done in the case of Roses for exhibition. The centre bud is usually retained, and the two side ones removed. Do this as early as possible, even if you have to prick them out with a goose quill, then all the strength goes into the bud retained. With Teas for exhibition it is even necessary to remove the side shoots that break out before the bud is as large as a marble. But for garden decoration the glorious Teas should have all their buds retained. Some of the hybrids that make bunches of buds are all the better thinned even if only for cutting for decoration, otherwise no good flower will develop. Show boxes must be prepared. Nothing helps more to win prizes than a good style of arranging the blossoms. Foster's tubes prevent dumpiness. Give liquid manure twice a week to such Roses as have not received an artificial dressing. In watering remember a good soaking is better than three or four driblets. Worn-out pot Roses, or plants that have become leggy, if planted out into good loam, will enjoy a fresh lease of life.

The glorious array of single and semi-double Roses, briars, and a host of lovely kinds will now be in full bloom. Try and see a good collection growing. More will be gained than by an inspection at a flower-show.

JULY.—As the perpetual Roses go out of bloom, cut back their growths to a good eye looking outward, but not too low. If this is done carefully the perpetual character is more developed. Old growths on Wall Roses, such as Teas, Banksias, &c., when they have blossomed should be removed, retaining last season's growths, and those of the current season. Tea Roses in pots that have now flowered for the second time must be removed to a sunny spot outdoors. Do not neglect them, but give liquid manure now and then, and they must not suffer for want of water. They must remain here until the time comes to repot (September). Repot now Roses required for early forcing next winter. Pot off cuttings rooted under glass. Put in cuttings under bell glasses in a shady spot outdoors. If able to attend to them the cuttings do remarkably well if dibbled into small pots, one cutting in a pot. Use very sandy soil. The frames of such cuttings may be placed in full sunlight, but paint the glass with whitewash containing size. Sprinkle the foliage every hour when the sun is bright. Cuttings will root in this manner most readily. Then remove them to a pit, and repot when required.

Cuttings rooted in greenhouse should be potted off when the roots are about an inch long. Keep in a close frame in house for a week,

then put on stage, standing the pots on ashes. Do not water much at root, but keep tops lightly syringed two or three times a day. If mildew becomes troublesome indoors or out, give a good dusting with black sulphur. Sulphide of potassium sprayed on foliage with Abol syringe is an excellent preventive. Spray the under part of foliage also. Suckers must be kept down, those from the root being removed with an iron spud.

Budding will now be in full swing.

AUGUST is a quiet month. Mildew is usually troublesome, but it cannot well be avoided—one is at the mercy of the weather. The most affected shoots may be cut off. Mildew is often caused through want of good hoeing, too much water or not enough, and over-doses of liquid manure. Trench ground well, keep plants thrifty, and much of the evils they are prone to will disappear. Soil should now be prepared for potting next month. If bone-meal is used (and no better fertiliser for Roses can be found) add this now at the rate of a five-inch pot to a barrow-load of soil. Keep the compost in an airy shed away from wet.

Layering is best done this month. Wherever a growth is pliable enough to bend, an own-root plant may be secured. Give the shoot a twist if too risky to cut it; put it under the earth as explained, using plenty of sand about that part which is under the ground. Fine plants in about eighteen months are to be had by this method of propagation.

SEPTEMBER.—Where possible the beginner should commence his operations this month. The bed or border that he proposes to plant with Roses should be trenched. By doing this a month before planting the ground settles down and is in better condition for planting when the time arrives.

Cuttings of hardy Roses should now be made and planted at once. This would include some cuttings of Hedge Briars, also Manetti, for stocks, if anxious to bud a few for one's self. If Manetti be not available, cuttings of old-fashioned and Rambler Roses will answer as well.

Buds that were inserted in July should now be untied if not already done. If any are dead it may not be too late to rebud dwarf stocks.

Climbers on walls, arches, or pillars, should be unfastened and old and dead wood cut away. Where plants have been neglected this thinning should be done by degrees, not in one season. Tall climbers, such as Gloire de Dijon, are best unfastened and laid carefully on the ground. The old wood can be more easily removed and the plant refastened in a more satisfactory way. Roses that were grown under glass in the late spring, and that have been plunged outdoors for the summer must now be repotted. Afterwards stand them on a bed of ashes, and syringe morning and evening for a week or two. If very dry, water at the root. Loam may sometimes be bought at a reasonable price where building operations are going on. If so, do not fail to secure a load or two. This is the stuff to grow good Roses in both in pots and beds.

OCTOBER.—Study the catalogues carefully and give the order early. Never buy cheap Roses because they are cheap. Go to a good house that has a reputation of supplying quality and true to name. Remember many of the old Roses are still the best. The lists have been carefully pre-

pared, so that the novice need have no hesitation as to his selections. By the third week planting may commence. Roses may be planted from October to April, but October and November are the best months. If the plants have much foliage when received cut it off. Cover their roots with earth immediately the package is undone. Never let the roots become exposed to sun or wind. If the weather is dry, water the plants before filling in all the soil, and again at intervals of a few days. Replanting of established Roses may be begun at the end of the month. Roses that have been planted from six to ten years may be safely transplanted, and this often gives them a new lease of life.

NOVEMBER.—Planting is now in full swing, many millions of Roses being annually planted during this month.

Standard Briars for budding should also be planted, other stocks being best kept healed in until February and March.

Tea Roses grown as bushes should be earthed up like potatoes by the end of the month. This is maintained until March. Bracken fern should be at hand ready to place among the branches both of bush and standard Teas.

Pot Roses must now be put under cover, except those potted from the ground last month. These may be kept outdoors plunged until January, unless the weather is very severe.

DECEMBER.—Be prepared to protect Tea Roses if hard weather occurs. They are better for the free circulation of air, providing the frost is not severe. During mild intervals the fern litter or evergreens should be removed, to be replaced when hard frosts occur again. Pot Roses for early forcing should now be pruned. With moderate heat, three months elapse from the pruning to the blossoming of a pot Rose, so that if wanted before March the plants should be pruned in November. Climbers under glass, if attended to in the summer, will merely require tying out now.

THE GARLAND ROSE AT MUNSTEAD.

THE GREENHOUSE AND CONSERVATORY

THE greenhouse is an indoor garden. It may be a pretty creation or a muddle of anything and everything, and there is a general and unfortunate tendency to attempt too much. When many plants are brought together, some requiring distinct treatment to others, failures must occur. This does not mean that it is impossible to grow a beautiful and varied collection of plants, but the selection must be right, and the requirements of individual things carefully studied. The word greenhouse, regarded from the practical gardener's point of view, signifies a glass structure, in which no fire-heat is given during the summer, and only sufficient in the winter to prevent the temperature falling below 40 degrees. At that season the structure is used for storing such plants as Pelargoniums, Heliotropes, Petunias, Fuchsias, and a host of other things that need almost entire rest during the winter. In the case of the amateur, however, the greenhouse is a more general plant home. The building itself, size, shape, position, and other particulars, depend upon the surroundings to a great extent.

The Most Satisfactory Shape is the span roof, as the light is then distributed equally on both sides, the result being plants of better shape than can be grown under other conditions. The great objection to a span-roof structure in a small place is the amount of room it occupies, hence what is known as a lean-to greenhouse is popular. This may be erected against any wall of sufficient height, and is frequently attached to the dwelling-house. In such a structure the plants grow quite one-sided, unless they are occasionally turned round.

In erecting a greenhouse, whether large or small, it should be plain and substantial. A complicated design, with more or less coloured glass, is a death-trap to many plants. The arrangement of the staging in a span-roof greenhouse will to a certain extent depend upon the width of the structure. When it is ten feet wide, three feet may be set apart for a centre path, with a stage on each side three feet six inches wide. In narrower houses these dimensions may be proportionately reduced. For a house sixteen feet wide a central stage is necessary. It may be four feet in width, with a walk of three feet on each

side, and an outside stage of the same dimensions—sixteen feet in all. Ample ventilation is essential, and this should be provided for by means of lifting or sliding lights on the top, and also in the sashes around the sides, while if it is to be heated by hot-water pipes, a few wooden traps in the wall close to the pipes are serviceable. By means of these a little air may be given in the winter, when the pipes are hot, without lowering the temperature to any extent, the cool air admitted by this means serving to neutralise the drying effects of the hot pipes.

For a lean-to greenhouse the question of ventilation applies with equal force, but, of course, the arrangement of the staging is quite different from that of a span-roof structure. The usual plan is to have a stage along the front, then the path, and at the back of the house a stage arranged in a step-like way, so that the plants can obtain a full amount of light and air.

Various materials are used for staging, one of the neatest and most permanent being slates, but their cost is frequently prohibitive. If the stage is made of ordinary deals, two good coats of red-lead priming must be given before applying the paint. Flat stages should be covered with a moisture-retaining material, and for this purpose nothing is better than the sea shingle, largely composed of cockle shells, used so much for paths, &c. Besides retaining the moisture, it is sweet, clean, and does not harbour insects. Other materials may be used, such as fine gravel, with the sand sifted out, ashes, &c., but shingle is the most satisfactory.

Position.—Where a choice of position exists—an unusual occurrence, except in large gardens—a span-roof structure should run east and west, thus allowing the midday sun to shine full on its side. With a lean-to one must take advantage of an existing wall, therefore it by no means invariably faces the south; indeed, it is sometimes almost entirely shaded. Even when a greenhouse is shut off from the sun it may be made attractive, though the selection of plants for this purpose will be different from that in a sunny spot. Hardy Ferns would succeed in a shaded house.

Shading.—Though, as stated, a greenhouse in a quite shaded place is suitable for only a small collection of plants, yet full sun is injurious to so many subjects that shading is absolutely necessary, and that not only for the sake of the plants themselves, but for comfort too. The most desirable form of shading material is some kind of canvas fastened on rollers, so that it can be drawn up when not required. This needs constant attention, therefore many prefer permanent shading. Numerous mixtures are sold for the purpose. One that can be thoroughly recommended is known as "Summer Cloud."

A good home-made permanent shading can be formed by placing seven pounds of size in a pail, and standing it over the fire until dissolved, then stir in a knob of whiting, pounded fine, and one pound of Brunswick green. This must be applied, while still warm, on the outside of the glass with a painter's brush, and if the sun is shining on the glass at the time so much the better. This shading gradually thins, so that by the autumn, when the sun loses power, there is little left.

In a sunny spot when the shading is on rollers it may be used during

the brightest part of the day from the middle of March onwards. Flowering subjects last much longer thus treated, but permanent shading should not be put on before April.

So many horticultural builders now make a specialty of greenhouses for the amateur that even if it be intended to put up the structure one's self the most satisfactory way will be to obtain the materials from a trustworthy firm, and supplied ready for putting together. After the house is put up two or three good coats of paint both inside and out should be given, as these preserve the wood.

Heating.—During the greater part of the year artificial heat is unnecessary for the greenhouse; it is required more or less throughout the late autumn, winter, and early spring months. Various devices have been employed to keep the structure at a given temperature during frosty weather, but the usual way is to have a boiler outside to heat a certain quantity of hot-water pipes within the greenhouses. Several prominent manufacturers have devoted much attention to the production of a boiler that needs little attention and will burn for many hours, with the result that some most effective boilers can now be obtained. The quantity of pipes necessary to protect from frost and their arrangement depend so much upon the situation of the structure and many other items that the most satisfactory way is, after having selected the form of boiler, to ask the maker's advice. Of course all particulars must be supplied, as in this way only a correct opinion can be formed. In the case of boilers of all kinds much depends upon the way they are managed. Cleanliness is an important item, and this applies not only to the boiler itself, but to the flues connected with it. In frosty weather the most critical time is usually about daybreak, hence the boiler should if possible be attended to then, and if it has remained untouched through the night it will contain little fire. This must be freed from ashes and clinkers, when it burns freely, and soon causes the water to circulate briskly in the hot-water pipes at that important moment. Care should be taken, however, not to make the pipes too hot, as they then give off an enervating dry heat injurious to plants, though it encourages the insects that prey upon them. Such being the case it is better to spread the heat over more pipes than to keep those in use too hot. Whether coal or coke is used it should be broken small and slightly damped, as it will then last longer and give greater heat. Attention to these minor details makes the successful stoker. In the case of an amateur with a small greenhouse two great objections to the above-named systems of heating are: firstly, the expense; and secondly, the fact that stoking, even if carefully done, is dirty work, and irritating late in the evening, when during frost the fire must be attended to. This has led to a great increase in the use of

Oil Lamps for keeping out the frost, and the firm of Rippingille, so noted for their oil stoves of all kinds, have brought out some good forms for heating greenhouses. Though varying in power the principle remains the same; it is that of an upright boiler, connected by means of hot-water pipes with a standard of the same height as the boiler. This allows a free circulation of water, and of course the heat given off is

considerable. The heating apparatus consists of a large sliding tank for the oil and one or more burners. A sufficient quantity of oil is stored to burn from sixteen to twenty hours, thus avoiding soiled hands and unpleasant work late in the evening. Of course the lamp requires regular and careful trimming, a remark that applies with equal force to an ordinary table-lamp. Even a table-lamp of the duplex kind will protect the plants in a small house from danger during a sharp frost. The different forms of hot-water apparatus heated by oil are perfectly free from smoke and smell, provided always that the lamp is thoroughly trimmed. It is portable, therefore can be readily shifted to that part of the structure requiring the greatest amount of heat. As the lamps require no chimneys, flues, or fixtures of any kind, and the dirt and inconvenience of stoking are entirely obviated, the different forms of oil stoves may be recommended to the amateur. A little experience will determine the best position for the stove, which should not be closer to the plants than can be helped, consistent with being in the best position for heating the greenhouse.

As with proper attention the lamps are quite clean and free from smell, these oil stoves can be used where the greenhouse or conservatory is attached to the house, with a communication between the two. They are not in the least unsightly; indeed, some of the better forms are quite ornamental. When heating a greenhouse too high a temperature must not be maintained during winter. The object is simply to keep the plants free from frost and not to unduly excite them, for those that experience a period of comparative rest during the winter grow with greater freedom than those which have been placed under warmer conditions at the dull period of the year. For an average greenhouse, with the usual occupants of such a structure, a night temperature of 45 degrees is quite sufficient; indeed, it may during very severe weather drop another 5 degrees without injury. Even in the depth of winter artificial heat may be frequently dispensed with for days together; but after a spell of wet, dull weather, even when no frost is likely to occur, it is sometimes advisable to light the stove for a short time to dry up superfluous moisture.

Many forms of propagating cases for seeds and cuttings are heated with an oil lamp; but an objection to these is that they give off too much heat, hence the young plants quickly become debilitated, and are not so strong as those raised in the ordinary atmosphere of the greenhouse.

Potting Soils.—The preparation of soils for potting is important, and often sadly neglected. It is a common practice to dig up a little garden soil for this purpose, the result being unhealthy plants, and general disappointment.

The potting composts, which are blended in various ways according to the requirements of the plants, are technically known as loam, peat, leaf-mould, decayed manure, sand, and cocoanut fibre refuse.

Of these the most important is—

Loam, as it forms the principal portion of the compost for nearly all classes of plants. It is really the common earth of the fields and

HYBRID CINERARIA LADY THISELTON—DYER.

meadows, and in some districts good loam is easy to obtain. Loam should be fairly adhesive, but sufficiently friable to break up if rubbed between the fingers. Some loams are of a more clayey nature than others, but this may be neutralised by mixing in an increased quantity of peat or leaf-mould, which are described later on. Too near an approach to clay will, however, render the soil useless for potting. The best loam, that generally used in high-class gardens and in nurseries, is obtained by taking the top spit of a meadow and making it into a stack with the grass side downwards. This must remain in bulk for at least a year (and two years are better), until the grass is quite dead, and only the fibres which serve to keep the soil porous remain. Some localities, particularly in Surrey and Hampshire, are famous for their loam, which is sent to all parts of the country for potting.

Peat is principally obtained from commons, on which the heath and bracken flourish, the neighbourhood of the New Forest being noted for the superior quality of its peat. It is dark in colour, and principally composed of decayed vegetable matter, roots of various kinds, and sand. Peat is naturally of an open nature, and water passes easily through it. It is mixed with loam to form a compost that is readily drained, as stagnant moisture is detrimental to successful plant-culture.

Leaf-mould is formed of decayed leaves which are collected in a heap and turned over occasionally until the leaves themselves disappear into a dark-coloured mould. Where leaves and dung are mixed together to form a hot-bed, this matter, when thoroughly decayed, is most useful for potting. The leaves of the Oak and Beech are among the best for the production of leaf-mould, which is used for the same purpose as peat.

Manure in a fresh or crude state is too violent in its effects to go with potting soil, but cow manure is, when thoroughly decayed, a valuable stimulant. It must, however, be quite dry, otherwise it is often infested with worms to such an extent that successful plant-culture is rendered impossible.

Sand is of great service in increasing the porosity of soils, and is useful for cuttings, small seedlings, and any subjects with tender and delicate roots. Silver sand is principally used, but in many districts sand of good quality is deposited by the side of small running streams.

Cocoanut Fibre Refuse.—This is a valuable but little understood substance. By many it is regarded as a manure, but this is a mistake. Cuttings of many subjects strike root readily in a mixture of cocoanut fibre refuse and sand, but they must be potted into soil soon after the roots are formed, otherwise they are apt to decay. It may also be mixed with loam where peat or leaf-mould are not available, but these last are preferable. For covering the surface of small beds of flowers, either to prevent too rapid evaporation, or to save the flowers from being splashed by the rain, cocoanut fibre refuse is excellent, while it is used largely to plunge pots in so that the roots do not dry so quickly as when fully exposed.

The Mixing of Soils is an important item, the proportions employed depending upon the plants for which the soil is intended, and

also upon the consistency of the loam. A few pieces of general advice, however, will be of great service to the beginner. For the majority of plants, such as Fuchsias, Pelargoniums, Heliotropes, Petunias, and a host of similar subjects, a suitable compost may be formed of two-parts loam to one-part leaf-mould, or, failing this, peat, and about half a part each of sand and decayed manure. None of the ingredients should be sifted, but the lumps broken up with the hand; indeed, the sieve is frequently a mistake, as it deprives the soil of the matter which renders it porous. For cuttings, seed-sowing, and transplanting tiny seedlings, the soil should be passed through a sieve with a quarter of an inch mesh, but for general potting it must not be sifted. When the mixture above mentioned is thoroughly incorporated together, it is fit for use. In potting, see that the soil contains the requisite amount of moisture, as if too dry or too wet future success is unlikely. A good guide is to take a handful of soil and press it tightly together. It should be sufficiently moist to retain its shape, and yet dry enough to crumble to pieces when rubbed. If dry soil is damped, it must stand twenty-four hours before use, in order to allow the mass to be in one condition of moisture.

Though these directions as to the mixing of soil, &c., are given, the amateur with limited space who happens to reside in the neighbourhood of a nursery or florist, will be able to obtain suitable soil for general purposes already mixed at a cheap rate, and will find this a convenient method to adopt.

Seed Sowing and Propagation by Cuttings.—Many beautiful flowering plants can be raised from seed, including not only many available for the greenhouse itself, but also that large class known as tender annuals, which should be raised under glass and planted out later on. Such popular flowers as China Asters, Zinnias, Balsams, and Celosias may be treated in this way. Whether seeds are sown in boxes, pans, or pots, the method of procedure remains the same. Thorough drainage is necessary, therefore ensure this by putting a layer of broken crocks in the bottom of the pot, pan, or box. On this place the soil and press it down moderately firm to about half an inch below the rim. Make it level, but do not pat the surface smooth, as this prevents the roots from entering readily into the soil when the seed germinates. Having prepared the receptacles, sow the seed by sprinkling it on the surface of the soil, taking care not to sow too thickly. There is a great tendency to do this, especially in the case of small seeds that retain their vitality well, and if crowded together the seedlings quickly become weakened, and never attain the vigour of those that are allowed ample space from birth. After sowing cover the seeds by a sprinkling of soil that has been passed through a sieve with a quarter of an inch mesh. The depth of the covering depends greatly upon the size of the seeds, a good general guide being to bury the seed at its own depth below the surface of the soil. This in the case of minute seeds means merely a slight sprinkling. Some seeds, such as those of Acacias and Cannas, are very hard, and frequently take a long time to germinate if sown in the ordinary way. To assist germination the seeds are sometimes filed,

but there is some risk in this, a more satisfactory plan being to soak hard seeds for twenty-four hours in warm water. It should be kept if possible at a temperature of 80 degrees to 85 degrees. This treatment will have a considerable effect on the seed, which must be sown directly it is taken from the water. The soil must not get too dry after sowing as the seeds will be just on the point of starting into growth, and in this stage are soon injured by drought.

In the case of very tiny seeds such as Begonia, Gloxinia, Lobelia, and others a different course of treatment is needed. After sowing the seed thinly on the moistened surface of the soil, which has been watered through a fine rose just beforehand, the only covering needed will be a pane of glass laid over the top. This should be allowed to remain until the seeds germinate. When this is done the sun must not shine on the glass, otherwise the small space between it and the surface of the soil will be so hot as to roast the tender seedlings. As soon as they have formed the cotyledons, or seed-leaves, remove the glass and inure the young plants to the ordinary atmosphere of the greenhouse. With regard to the length of time occupied by seeds before they germinate no hard-and-fast line can be given, as some remain much longer in the ground than others; while much also depends upon the seed itself, for if kept a long time before sowing its germination is, as a rule, more irregular than if sown soon after it is ripe. Thus Primula seed will often germinate in a fortnight or so after sowing, but it may remain for a year and finally grow.

The seeds of all that section of plants known as dicotyledons, which include most subjects grown for the greenhouse, first push above the surface a pair of cotyledons, or seed-leaves, as they are often called. Then from the centre of these appears the first proper leaf, and as the plants develop the cotyledons finally die away. A critical time with many seedlings is just as the first true leaf develops, the young plants being apt to topple over and decay. This kind of decay is known as "damping off," and is frequently due to an excess of moisture or too close an atmosphere, but however carefully seedlings are looked after it is very liable to happen, especially if crowded. To stop this damping off transfer the young seedlings to other pots or pans, using a pointed piece of wood known as a dibble in the case of small kinds.

Pricking off the Seedlings.—The process referred to in horticultural publications as "pricking off" is carried out in the following manner:—The pots or pans are prepared as for seed-sowing, then with a pointed piece of wood one of the seedlings is carefully lifted without injuring the roots. With the dibble held perpendicularly, make a hole sufficiently deep to take the young plant, burying the stem almost to the cotyledons. Never make the hole deeper than is necessary, otherwise a cavity will remain at the bottom. To close the soil around the seedling when it is placed in position, insert the dibble exactly as before, but from a quarter to half an inch from the little plant, towards which the soil must be pressed. By this means the buried portion of the stem is held in position throughout its length, and not merely on the upper part as is so often practised. When this is finished the soil

must be watered through a fine rose, sufficient being used to settle everything in its place, after which shade the plants for a few days until the roots recover from the check sustained during transplanting. When the young plants crowd each other either put them into small pots or plant them out.

In the case of seedlings of strong growing plants, such as Cannas, no pricking off will be necessary, the young plants being simply transferred from the pots or pans in which they have been sown and potted singly into small pots.

The process known as

Hardening off—that is, gradually inuring plants to changes of condition and of temperature—is of great importance, for if plants grown under glass and partially shaded are suddenly transferred to the open ground they are sure to suffer, while if the change is gradual they will not be affected. In the case of seedlings that have been raised in the greenhouse for planting out in the open ground later on, take advantage of a dull or showery day for the work, as then they quickly recover from the check occasioned by removal.

Cuttings.—Many plants can be propagated by cuttings, and though some require different treatment from others, a few simple rules will general suffice to achieve success. As the cuttings when separated from the parent plant quickly flag if fully exposed to the air, a small frame is necessary, air-tight, or nearly so, and fitted with glass lights. This, which is usually like an ordinary garden frame in shape, is known as a propagating case; but failing this a home-made article may be improvised that will answer the same purpose. A shallow box, about seven or eight inches deep, slightly higher at the back than at the front, with a few squares of glass laid over it, forms a good propagating case for most greenhouse plants. The glass must be removed each morning to drain off accumulated moisture, and also to allow for the removal of any decaying leaves, while the soil when dry may be watered.

The majority of greenhouse plants, including such popular subjects as Fuchsias, Heliotropes, Petunias, Begonias, Coleus, and many others, all strike root readily with the following treatment:—Take some clean four-inch pots, place one crock (that is, a piece of broken pot) in the bottom, so as to cover the hole, then over this a few smaller pieces. Then make a mixture of equal parts of loam, leaf-mould, or peat, and silver sand, and pass the whole through a sieve with a mesh of a quarter to half an inch. The result will be a sandy mixture without large lumps. With this fill the prepared pots moderately firm to within a quarter of an inch of the top, and they are then ready for the cuttings. The spring is the busiest period with the propagator, but cuttings may also be put in successfully throughout the summer months. The best cuttings as a rule consist of the young growing shoots, taken off at a length of about three inches, and when the bottom leaves are removed they are ready for insertion. The cuttings must be put in with a dibble exactly as directed for pricking off seedlings, and care must be taken not to overcrowd them, as if this is done, decay is liable to set in. At the same time, space within the propagating case is usually in demand, so that no

room must be wasted. Seven cuttings of such subjects as Fuchsias and Heliotropes may be, as a rule, accommodated in a four-inch pot. Directly they are put in give them a good watering through a fine rose. The warmest part of the greenhouse should be chosen for the propagating case, and when this structure is kept at a slightly higher temperature the cuttings will root more quickly. Even when the greenhouse is shaded, lay an additional sheet of paper over the propagating case until the cuttings are rooted. As soon as this takes place more air must be given, and the cuttings gradually inured to the ordinary atmosphere of the greenhouse, when they should be potted singly into small pots. Many cuttings strike root in three weeks or so, so that from even a small case a considerable number of things can be turned out during the season. By many people bottom heat is considered necessary for propagation by cuttings, but this is not the case, though, of course, they strike in less time with the additional warmth.

Though cuttings of most plants may be struck according to the directions above given, there are exceptions, one of the most important being the Pelargonium, or Geranium, as it is often called, which is represented in our gardens by innumerable varieties. For these prepare the pots as just recommended for other subjects, but the cuttings are treated differently. They should be cut clean off just below a joint, with a sharp knife, and the bottom leaf removed. Then take off the small leaf-like scales that are formed on the stem, as these otherwise frequently prove a source of decay. The cuttings should then be inserted in the pots prepared for them, give a good watering, and stand on a shelf or a similar position in the greenhouse. Though the leaves will flag, and many of the cuttings after a few days look unhappy, they soon root under this treatment, not damping off or becoming attenuated as would result in a close case. Of course the soil must be kept moderately moist. When a pot is prepared for cuttings it is finished off by some growers with a layer of clean silver sand on the top, but this is not recommended, as if at all exposed the sand quickly dries, hence a mistake is often made of watering the cuttings when the soil below the layer of sand is sufficiently wet, and this may lead to disastrous results.

CUTTING OF "GERANIUM"

Another class of plants requiring still different treatment comprises those of a succulent nature, which will not flag however exposed. The cuttings of these should not be inserted for a day after being separated from the parent plant, as when full of sap they are liable to decay.

These remarks apply to the numerous flowering Cacti, *Rochea falcata Crassula*, or *Kalosanthes coccinea*, and such subjects. The best cuttings of these flowering Cacti are furnished by the shoots from four inches to six inches long, pulled off at the base from their point of union with the main stem. A little brick rubble mixed with the soil is in their case an advantage.

Propagation by cuttings must be resorted to in order to increase any particular variety among the numerous florist's flowers, for such things as Fuchsias, Pelargoniums, Begonias, and similar subjects cannot be raised from seed with the knowledge that the progeny will resemble the parent plant. Raising seedlings of such things is, however, very interesting, and there is always the chance of obtaining something good.

Potting.—This is an important operation in plant-culture, and success depends upon the way in which this work is managed. The first consideration is to see that the pots used are thoroughly clean. When dirty, wash them inside and out, and allow them to get quite dry again before use. Proper drainage, too, is essential. This is provided by placing a piece of broken flower-pot, known as a crock, over the hole in the bottom, and a few other smaller crocks around it. Oyster-shells form a good substitute for broken crocks; indeed, by many they are preferred. Whichever is used, place them with the concave side downwards, as by so doing surplus water runs away freely, whereas, if the convex portion is placed directly over the hole, a very little soil will stop the drainage. The soil employed must be in an even condition of moisture, as mentioned under the head of potting-soils The operation of shifting a plant from the pot in which it has been growing into a larger one is carried out in the following manner:—

SHOWS DRAINAGE IN FLOWER-POT

On this, composed of broken potsherds, should first be placed a little moss, or turfy soil, before filling with mould.

First take care that the ball of earth of the plant that one is going to shift is neither too wet nor too dry; then remove it from the pot by turning it nearly upside down, supporting what was the upper surface of the ball of earth with the left hand, and holding the pot in the right. A sharp tap of the edge of the pot on the potting-bench will bring the entire ball of earth out of the pot, and, as its weight then falls directly on the left hand, take care that at that moment it does not drop. Then remove the crocks, without bruising or injuring the roots in any way. This done, loosen with a pointed stick some of the principal roots that are wound round the ball of earth, so that they will more readily take possession of the new soil when potted. Of course, this must be carried out carefully; but a little practice will soon determine the extent to which the roots can be disturbed without injury, in fact, to the future benefit of the plant, which will be now ready for the new pot. Its size will, of course, depend upon the kind of plant to be potted and its condition, but generally a good healthy plant, when shifted, should be put into a pot sufficiently large to allow a space of an inch between the ball of earth

and the side of the pot. The actual potting is then performed by taking a handful of the coarsest of the soil and placing it immediately over the crocks, then further adding sufficient soil so that the upper part of the ball of earth will be about half an inch below the rim of the pot. Fill in the soil around the sides, pressing it down firmly and evenly. If cavities are left, failure will probably result. In pressing down the soil, particularly if a lesser space than an inch is allowed, a piece of wood, such as a lath, will be useful. The sharp edges of it should be smoothed down, otherwise the roots may be injured. The potting operation is complete when the new soil is worked all around, and the old ball of earth slightly covered with it. Allow half an inch or so from the level of the rim of the pot to the old ball, but for large pots give an inch space. When potting is completed, well water the plant through a rose to settle the soil thoroughly in its place, and, where it can be managed, newly potted plants are benefited by being kept rather closer for a few days until the roots recover from the check they have experienced. When several cuttings and seedlings are together in one pot, the operation of separating and putting them into single pots is known as—

Potting Off.—This should take place before the roots get much matted together, otherwise bruising will result when they are disen tangled. Potting off means turning the ball of earth out of the pot, and singling out each plant with as little damage to the roots as possible. Then repot in suitable soil, burying the naked stem of seedlings almost to the cotyledons. For cuttings or seedlings pots from three inches to four inches in diameter are suitable, and as just advised in the case of those that are repotted, the young plants should be kept rather close and shaded for a few days until they take hold of the new soil. Plants that have sustained a check at the roots, and sometimes this is unavoidable, are much refreshed by light syringings, rapid evaporation being arrested. In the case of plants with roots which do not take a very firm hold of the soil, moving them about will result in injury unless the stems are secured to a stick. The stake should be rounded and thoroughly pointed to avoid injury to the roots. Then push it down to the bottom of the pot perpendicularly, otherwise when it is withdrawn and reinserted damage to the roots may result. In tying plants, particularly those of quick growth, future growth must be allowed for, so that whether the material used be raffia, thread, or string, it must not be tied too tightly round the growing shoots.

General Treatment of the Greenhouse throughout the Year.—Position and other surrounding features will to some extent influence the treatment to which the occupants of the greenhouse are subjected, for in some places a drier atmosphere exists than in others. During the winter greenhouse plants are partially at rest as a rule, hence they must be kept drier than when in active growth. At the same time extreme drought will work considerable havoc, for it is necessary to keep the soil moderately moist. Such things as Tulips, Hyacinths, Azaleas, and others, with flowers that develop in the spring need, of course, more water than plants at rest. Too great a heat must be avoided; a

minimum night temperature of 45 degrees with a rise of 5 degrees to 10 degrees during the daytime being sufficient. When the weather is very severe the thermometer may fall five degrees lower than the temperatures given without injury. As spring advances and the sun gains power a moister atmosphere is necessary, and to maintain this the plants should be occasionally syringed, and the floor and exposed portion of the stages damped. By the middle of March if the greenhouse is fully exposed to the sun, shading for a few hours during the brightest part of the day is beneficial to plants in flower, and unless the structure is differently situated, it may be kept up until October. Shading, however, should only be given as a protection from the full sun, because, used at any other time, it tends to weaken the plants. Permanent shading alluded to previously cannot be recommended for this reason. By the end of May many greenhouse plants that have finished flowering may be placed out of doors, and the structure used for numerous summer blooming plants. Such things as Azaleas, Heaths, and Rhododendrons set their buds in preparation for a future display of bloom more readily in the open air than when grown altogether under glass. Remember, however, that by the end of May the sun is very powerful. Shading from bright sunshine will be necessary for a few days for the plants brought from the greenhouse, otherwise the foliage is apt to turn brown, and being permanent, injury of this kind is serious. Water must be cautiously given to greenhouse plants placed out of doors, particularly during showery weather, for with the surface slightly moistened, one is apt to be deceived, and two or three hours' sunshine and wind will work havoc. As worms quickly injure many plants by choking up the drainage, stand the pots on a firm and level bed of coal ashes or some other rough material. The trouble of watering is greatly lessened if the pots are plunged, but this should not be the practice in ordinary garden soil. Ashes are vastly preferable, or cocoanut fibre refuse may be used. About the middle of September is a good time to return again to the greenhouse those plants that have spent the summer out of doors, as by then frosts and heavy rains frequently occur. A free circulation of air should, if possible, be allowed for a week or two after their change of quarters, as if kept too close many leaves are liable to drop.

Insect Pests were at one time a source of great tribulation when the only method of destroying aphides or green-fly was by means of fumigation, but the different forms of vaporising—that is, distributing the nicotine in the form of steam—are now so simple and effectual as to occasion no personal discomfort whatever. The XL-All Vaporiser has been before the public for some years, and grows in favour. A small spirit-lamp is the medium of disseminating the steam. Not only are aphides destroyed by this insecticide, but thrips also, while mealy-bug is greatly checked by its occasional use. Scale that stick principally on the under sides of the leaves and on the stems may be removed by one of the various washes sold for the purpose, while the following method is also effective. Heat some water to a temperature of about 120 degrees, but not more, and to every three gallons of this add a lump of soft soap quite the size of a hen's egg, and two wine glasses of petroleum. Stir

until thoroughly dissolved, then disturb the water by means of the syringe, otherwise the petroleum will float on the top. Lay the affected plants on their side and syringe with the mixture. A good way to keep the solution well mixed is to return each alternate syringe full to the pail containing the mixture. Unless this plan is followed the crude petroleum will quickly collect on the top, and in this undiluted form injure the foliage.

USEFUL GREENHOUSE PLANTS

BELOW is given a list of the finer greenhouse plants, with simple directions as to their culture.

Abutilon.—The Abutilons are shrubby plants six feet or more high, and will flower well when about eighteen inches high, and in pots five inches or six inches in diameter. They are also valuable for training to the roof of a greenhouse, or for clothing the back wall of that structure, in which positions their drooping, bell-shaped blossoms are seen to advantage. The flowers vary in colour from white to deep red, through different shades of yellow and pink, while in a few kinds the leaves are prettily variegated. In a warm structure they will flower almost throughout the year, but in an ordinary greenhouse need much the same treatment as a Fuchsia. Cuttings strike root readily by following general details previously given, and ordinary potting soil will suffice for their successful culture. A few good kinds are:—Boule de Neige, white; Golden Fleece, yellow; Royal Scarlet, and Sanglant, red; Anna Crozy, pink; Emperor, purplish. With variegated leaves—*Darwini tessellatum*, *Nævium marmoratum*, *Sellowianum variegatum*, Souvenir de Bonn, Sowitzi, Thomsoni, and *Vexillarium variegatum*. The white Boule de Neige is as useful as any; its bell-like flowers are quite white, and vigorous plants seem always in bloom.

Acacia.—A family of trees and shrubs, for the most part natives of Australia, and producing their yellow flowers during the spring months. They succeed in a mixture of equal parts of loam and peat, with a little sand. Cuttings are difficult to strike except in nurseries, where there are ample appliances for the purpose; and though seeds can often be obtained, plants raised in this way must attain a large size before they flower. *Acacia dealbata* is the plant so well known as "Mimosa," cut sprays of which form such a familiar object in London and provincial towns during the early months of the year. They are sent from the Mediterranean shore, where this Acacia grows into large trees. The following kinds produce thin little globular tufts of golden blossom in great profusion, even when the plants are quite small: *Acacia armata*, *grandis*, *platyptera*, and *pulchella*, while in *A. Drummondi* the flower clusters are in the shape of a bottle brush. *A. riceana* is a pretty climbing kind, with pale yellow blossoms. All the Acacias may be placed out of doors during the summer months.

Achimenes.—Pretty, little, soft growing plants that flower during the summer and pass the winter in a dormant state, when they must be kept dry. The underground portion consists of small, elongated tubers,

which about March should be shaken away from the old soil, and repotted in a mixture of equal parts of loam and leaf-mould with a little sand. Half-a-dozen tubers may be put in pots five inches in diameter, and these are sufficiently large for the Achimenes. When larger masses are desired deep pans may be used. They are also suitable for hanging baskets. In a warm house Achimenes will flower by the end of spring, but in a greenhouse they are at their best during the latter half of the summer. The flowers of all consist of a narrow tube, and a widely expanded mouth. The varieties are numerous with white, pink, mauve, scarlet, and purple blossoms.

African Lily. *See* Agapanthus.

Agapanthus. — Plants of bold growth with long, strap-shaped leaves, from among which are pushed up during the summer heads of pretty blue flowers, borne on stems three feet or four feet high. The commonest is *A. umbellatus*, to which the white *albus* (white flowers) affords a pleasing variety. There is also a double-flowered kind (*flore pleno*), while the miniature form known as *minor* is worth growing for the sake of variety. The Agapanthuses are useful for large pots or tubs for standing out of doors on steps, terraces, or similar positions during the summer months, and the flowers appear at that time. These tub specimens will keep in health for years without repotting, indeed, they do much better when the roots are closely confined. Agapanthuses are dormant during the winter, when they can be successfully wintered under the stage of a greenhouse, in a shed, coach-house, or similar position.

Agave.—The best known of the Agaves (a numerous class) is the American Aloe (*Agave americana*), a plant of symmetrical growth, and with huge fleshy leaves, furnished with large spines, disposed naturally in the shape of an immense rosette. It is sometimes called the Century Plant, from its reputed habit of never flowering until a hundred years have elapsed. This is quite a mistake, as the most casual observer knows. The leaves contain a strong fibre which is very valuable for rope-making. There is a variegated variety in which the leaves are striped with pale yellow. The American Aloe is just the thing for standing on steps, balconies, &c., as recommended for the Agapanthus.

Aloysia citriodora.—The Lemon Verbena, or Sweet Verbena, as this is often called, is popular, and no wonder, for its leaves are delightfully fragrant. In the milder districts of England it may be trained to a wall outside, but in most parts it needs the protection of a greenhouse, where, with the same treatment as a Fuchsia, it succeeds perfectly. Cuttings of the young shoots should be taken in the spring. The leaves when bruised give off an odour of fresh ripe lemons.

American Aloe. See *Agave americana.*

Aralia Sieboldi.—This is a stout growing plant, with large deep green leathery leaves. It is easily grown, is hardy in many districts, and most useful for sitting-rooms, draughty corridors, and similar places. It is often confounded with the Castor Oil Plant (*Ricinus*), a quite different thing. There is a variegated form of this Aralia in which the leaves are marked with white.

Araucaria.—A class of large trees nearly related to the Firs, and very symmetrical in growth. The most generally grown is the Norfolk Island Pine (*A. excelsa*), which has bright green branches produced in regular tiers. This plant must not be put in too large a pot, as effective specimens may be grown in a comparatively small size. Other rarer kinds are *A. Bidwilli*, *A. Cunninghami*, and *A. Cooki*.

Arum Lily. *See* Richardia.

Asparagus.—A beautiful class of climbing plants, many of which are remarkable for their delicate, frond-like branches. From this circumstance *A. plumosus nanus* is known as the Asparagus Fern, though it is in no way related to the Fern family. Grown in small pots these make effective decorative plants for a long while before they commence to climb. They need ordinary potting compost, and should be freely syringed during the summer months. The best are *A. plumosus*, *A. plumosus nanus*, *A. retrofractus*, *A. Sprengeri*, and *A. tenuissimus*.

Asparagus Fern. *See* Asparagus.

Aspidistra lurida.—A well-known and popular plant for the dwelling-house, with dark green leathery leaves. There is also a variegated variety. No plant is more useful for smoky towns and under other adverse conditions; its principal requirements are an occasional sponging and water when necessary. It succeeds in ordinary potting compost, and is increased by division, which should be carried out during the latter part of April or early in May.

Azalea.—The species that requires the protection of a greenhouse is that known as the Indian Azalea, of which there are many varieties, the different tints of white, pink, purplish-rose, and bright red being represented. They are largely grown in Belgium, and are sent to this country every autumn in considerable quantities in the shape of neat little bushes studded with flower-buds. They are usually grafted on to clear stems from six inches to nine inches high. When received these Azaleas are potted firmly into sandy peat, and placed in the greenhouse, where, if properly supplied with water and occasionally syringed, the roots will soon start into the new soil. They flower during the spring months, and to have them in good condition for the following season directly the blossoms are over, straggling branches must be cut back. Then, as soon as young shoots are visible on the cut portions, the plant must be potted if necessary. For this purpose sandy peat alone should be used, and in potting it must be rammed down firmly. The plants must then be returned to the greenhouse for a time, carefully watered, and liberally syringed. Never use too large a pot, and as the plants get old they will stand for years, keep in good health, and flower well, without being disturbed at the roots. Whether repotted or not the Azaleas must, after flowering, be syringed three or four times a day if possible, except during dull weather, to encourage a free growth. By the end of May or in June place them out of doors, and lightly shade them at first from the full rays of the sun. Take care that they are well supplied with water throughout the summer, and syringe morning and evening. Under such conditions the plants will not only grow freely but plenty of flower-buds will appear, which, during the follow

ASPARAGUS VERTICILLATUS OVER A PILLAR.

ing spring, will expand and make a bright display. Get the plants under cover before the autumn frosts. So treated Azaleas may be kept year after year in good condition. In a too dry atmosphere the leaves are liable to an attack of thrips, which can be eradicated in the way previously advised.

Balsam. *See* Impatiens.

Begonia.—The Begonias form an extensive class, which may be readily divided up into several distinct sections. First, we have the tuberous-rooted varieties, single and double, which are now so popular both for bedding out and for the greenhouse; then, there are the dwarf-growing forms of *B. semperflorens*, which are much used for bedding, and the several distinct kinds, valuable for their winter flowers, and in many cases they do not bloom in winter alone. Lastly, we have the numerous forms of *B. Rex*, remarkable for their large, handsomely-marked leaves. *B. Rex* is more delicate than the others, and although the plant will succeed in the greenhouse during the summer it cannot be depended upon to successfully pass the winter in that structure, though if the thermometer does not go below 45 degrees, and the atmosphere is at the time fairly dry, the more robust kinds of this section will, as a rule, be safe. Tuberous-rooted Begonias are generally increased by seeds sown early in the spring, though the particularly choice forms are propagated by cuttings. The seed is very minute, and full directions for sowing it are given in the previous chapter, entitled Seed Sowing.

Tuberous Begonias, particularly in a young state, prefer a light compost; hence a mixture of equal parts of loam and leaf-mould with a little sand will suit them well. After the seeds germinate and the young plants are picked off into a pot or pan, the next shift will be into pots three inches in diameter. When they are large enough they should be shifted into pots five inches in diameter, and unless there are a few specimens of exceptionable vigour this size of pot will be sufficient for the first season. Plants raised in this way will, as a rule, flower well during the latter half of the summer, particularly if they have a dose of weak liquid manure every fortnight after the pots get full of roots. In the autumn as the plants go to rest the water supply must be diminished, and the underground tubers will pass the winter in a dry state, provided they are not parched up. A fairly cool spot, where they are quite free from frost, is just the place for wintering tubers of Begonia, such as underneath the stage of the greenhouse, where it is free from drip, or a moderately dry cellar may be utilised for the purpose. Where the Begonias are few in number they may be allowed to remain throughout the winter in the pots they have grown in; but in the case of a considerable quantity economise the space by turning them out of the pots, freeing the tubers from the old soil, and laying them thickly in a shallow box or pan, then covering them with some dry mould. The size of first season's tubers will vary from that of a farthing to a penny, and when these are grown on the second season they yield the best results. March is a good month to take them from their winter's quarters and repot. They should be put into small pots at first, and shifted

into larger ones as soon as required. After the tubers are potted the soil should be kept slightly moist until the young growth appears above ground. When too wet some of the tubers will decay. The double-flowered varieties may to a certain extent be increased by seeds, but particular forms cannot be propagated in this way. When the seed is saved from the finest double flowers it will be necessary to fall back upon the semi-double blossoms to supply the pollen. Artificial fertilisation is needful to insure the production of good seed, hence the progeny will be somewhat mixed. Both the single and double kinds can be propagated by cuttings put in during the spring months. When Begonias are used for bedding, lift them at the first sign of frost, and lay them out for a few days on the greenhouse stage or in a similar position to dry. The stout succulent stems will in a short time drop away from the tubers, which can then be laid in boxes of soil as above recommended.

The dwarf-growing forms of *Begonia semperflorens* are more grown for bedding than for the greenhouse. One of the best known is Vernon, which is only a few inches high. The flowers are red, while the leaves become tinged with crimson of various shades, according to the season and the position in which they are placed.

An extensive class consists for the most part of varieties with fibrous (not tuberous) roots, the majority of which are of considerable value for the winter. Some of them have a thickened root stock, but they do not produce tubers like the summer-flowering kinds. These must be grown on during the summer and early autumn, and as the pots get full of roots weak liquid manure once a fortnight will be helpful. To flower these Begonias well a minimum temperature of 50 degrees during the winter is necessary. The best of this class are Carrieri, white; Gloire de Lorraine, pink, one of the most popular Begonias ever raised; Caledonia, a pure white form of Gloire de Lorraine; John Heal, carmine; Gloire de Sceaux, pink; Ensign, rose; Fuchsioides, bright red; Lynchiana, red; Paul Bruant, deep rose; Weltoniensis, pink; and Knowsleyana, blush.

The beautiful-leaved *Begonia Rex*, represented by numerous varieties, is always admired for the handsome marking of its large foliage; but, as above stated, only the most robust forms will pass the winter in the greenhouse. Even then the temperature must not fall below 45 degrees with a fairly dry atmosphere.

Bermuda Butter-cup. See *Oxalis cernua.*

Blue Gum. See *Eucalyptus globulus.*

Boronia.—This is a class of hard wooded plants, natives of Australia, and needing much the same treatment as that recommended for the Indian Azalea. The best Boronias are: *B. elatior*, rosy-red; *B. heterophylla*, carmine, a very pretty flower; and *B. megastigma*, with small, powerfully and sweetly-scented brownish-yellow bell-shaped flowers. All form neat little bushes, and all flower in the spring.

Bottle Brush Plant. See *Callistemon salignus.*

Bouvardia.—A popular class of greenhouse shrubs that may be propagated from cuttings of the young shoots in the spring after the

BEGONIA GLOIRE DE LORRAINE.

manner of a Fuchsia, grown on during the summer, and will flower in the autumn and winter. Their neat clusters of wax-like flowers are in great favour for button-holes and similar purposes. The pure white *B. Humboldti corymbiflora* has deliciously fragrant blossoms. Others are: Hogarth, scarlet; Mrs. Green, salmon; President Cleveland, brilliant scarlet; Queen of Roses, pink; and Vreelandi, white. Alfred Neuner, white; President Garfield, pink; and Hogarth fl. pl., have double blossoms.

Calceolaria.—The showiest and most popular Calceolarias, or Slipperworts, as they are sometimes called, are known as "herbaceous," in which the large, inflated pouches, suggesting in shape a fisherman's basket, are richly and quaintly coloured. Herbaceous Calceolarias are raised from seeds, the best time of the year to sow being about mid-summer, and the young plants so obtained will flower during the following spring. The seeds are very minute, hence they should be sown as advised for such seeds mentioned under the head of Seed Sowing. When the young plants are large enough to handle prick them off into pots or pans, and when sufficiently advanced transfer singly to small pots. A mixture of equal parts of loam and leaf-mould with a little sand will suit them well for the first potting, after which the amount of loam should be increased. The young plants must be kept in a light, airy position to prevent a weakly growth. Pots six inches in diameter are suitable to flower the plants in, and the strongest may be put in their flowering pots by the end of the summer, while the smallest should be left until early in March, when they will form a succession. In all stages aphides or green-fly must be especially guarded against, as they soon ruin the plants, but are easily kept down by vaporising. The varieties with smaller flowers, generally yellow, but sometimes reddish, are of a more woody texture than the herbaceous kinds, and can be struck from cuttings in the spring in the way of a Fuchsia. They are often used for bedding out, but can also be well grown in pots.

Calla. *See* Richardia.

Callistemon salignus.—This, often known as *Metrosideros floribunda*, is called the Bottle Brush Plant. The flowers, with their long scarlet stamens, are arranged around the shoots in the form of a bottle brush. It needs the same treatment as an Azalea.

Camellia.—The shining green leaves of the Camellia are ornamental at all seasons, and in spring, when the flowers appear, the different varieties are bright and effective. Many of the Camellias are hardy in several parts of the country, hence a cool greenhouse is all that they require. After the flowering season is past they may be kept under glass until the middle of June to allow the young shoots to become moderately firm, when they should be placed out of doors until the autumn, and if possible in a position where they are somewhat shaded from the full rays of the sun. A mixture of two-thirds loam to one-third peat with a little sand will suit them well, but take care not to put them in too large a pot, as the Camellia will stand for years and flower well without being shifted. As the buds develop a little weak

liquid manure will be of service, while bud dropping, frequently a source of trouble, is often caused by an insufficient circulation of air. Apart from its culture in pots or tubs, the Camellia does well planted out in the greenhouse or conservatory, provided a well-drained border is prepared for the roots. For covering a back wall it is one of the most beautiful plants we have, as winter and summer alike it is clothed with foliage. There is a long list of varieties, the old double white (*alba plena*) being still a general favourite.

Campanula.—Most of the Campanulas, or Canterbury Bells, are hardy, but the creeping kinds—*C. isophylla*, with blue flowers, and *C. isophylla alba*, with white, as well as the newer *C. Mayi*, with hoary leaves and pretty porcelain blue bells, form delightful plants when grown in suspended pots or baskets, and with attention they will flower throughout the greater part of the summer. They are increased by dividing the plants in the spring just before growth recommences. The peach-leaved Bellflower (*C. persicifolia*), and its varieties, *grandiflora*, in particular, are well adapted for pot culture. The Chimney Bellflower (*C. pyramidalis*) is also useful, and it is surprising that amateurs do not grow plants of such pronounced beauty more freely. It is simply necessary to sow seeds in pans in a cold frame in March, and when the seedlings are of sufficient size prick them out into the border, choosing a rich bit of ground, and there they may remain until the following spring. Then they must be lifted, potted, and placed in the open air until the flower-spikes are seen. It is wise then to transfer them to the greenhouse. The species is quite tall, six feet to seven feet, but by selection a dwarf strain has been got, and the blue and white colouring of the flowers is very pretty. In potting the plants, pot firmly, and use for soil a mixture of half sandy loam, and a quarter-part each of road grit and leaf-mould. It is most important to give water judiciously. An over-supply for any length of time will result in absolute failure, and a little soot water occasionally will assist growth. When the spikes are running up weak liquid manure should be given, but prepared chiefly from cow droppings, not stable drainings.

Canna.—Of late years the production of a race of Cannas of dwarfer growth, and with larger flowers than those formerly used for bedding out during the summer, has led to their frequent use for the greenhouse during the summer and early autumn months. Many of the flowers are of gorgeous colours, and though the individual blooms do not last long, a succession is maintained for a considerable time. The plants need liberal treatment, a suitable compost being two-parts loam to one-part each of leaf-mould and manure. As the pots get full of roots, liquid manure given occasionally is of value. In winter the Cannas go to rest, when the soil must only be kept slightly moist, but quite free from frost. On the return of spring, shake the roots almost free from the old soil, and when an increase of stock is required, divide the underground stems, leaving, however, a bud, or eye, to each. Then repot, but take care not to over-water until growth recommences.

Carex.—Pretty grassy plants of which there are two or three forms with variegated leaves that are valuable for grouping, and will succeed

in the dwelling-house for a long time. They are of easy culture, and need plenty of water when growing.

Castor Oil Plants. *See* Ricinus.

Celosia.—The brilliantly coloured plume-like flowers of *Celosia pyramidalis* are much admired, and the plants are welcome in the greenhouse, or bedded out of doors. The colours vary from pale yellow to crimson through various intermediate shades, some of the tints being remarkably vivid. Another Celosia is the Cockscomb, whose large, velvety-like crimson heads are strangely picturesque. All the Celosias are sown in a gentle heat in spring, and grown on freely in good, rich soil. They are not in the least difficult to grow.

Celsia.—There are two species of Celsia, both of which are valuable for the decoration of the greenhouse. *Celsia cretica* grows to a height of four to five feet, and is studded for the greater part of that distance with golden-yellow blossoms, while *C. Arcturus* is only about half the height and more branching. Both produce seeds freely, which should be sown in spring in ordinary soil.

Century Plant. See *Agave americana.*

Cherry Pie. *See* Heliotrope.

Chorozema.—A pretty class of slender growing shrubs, natives of Australia, all of which bear in profusion small pea-shaped blossoms of some shade of yellow or red. They need much the same treatment as the Indian Azalea, and are not plants for the ordinary greenhouse, or for a beginner.

Cineraria.—A wealth of blossom is furnished by the huge massive heads of the garden varieties of Cineraria, among which many different tints are represented. White flowers are, of course, always popular, and in direct contrast to this an intense purple-blue often occurs among the Cinerarias. An objection urged by some against these Cinerarias is their lumpy style of growth. Such objection, however, cannot be urged against some of the newer hybrids, obtained by the crossing of a few of the original species.

These are taller in growth than the others, and the individual flowers are much smaller, but they are borne in great profusion, and the entire plant is light and graceful. The long sprays, too, are valuable for cutting.

The usual method of increasing the Cineraria is by means of seed, which should be sown about May, though, when grown in quantity, two or three sowings are needful to maintain a succession. The seed is small, and care should be taken not to sow it too thickly. If sown lightly, it will soon germinate, and when the young plants are large enough put them out singly into small pots. A light, airy position in a frame will suit them in this stage, and when sufficiently advanced they may be shifted into the pots in which they are to flower. Some prefer pots six inches in diameter for all the Cinerarias, but good examples may be grown in five-inch size, using, however, the larger size for the vigorous plants. A mixture of two-thirds loam to one-third leaf-mould, with a little sand, is very suitable for the Cineraria. In all stages of growth they are liable to be attacked by aphides or green-fly,

which quickly injure them; but, at the same time, these pests are easily kept under by vaporising.

Clematis.—The different forms of Clematis are well known as beautiful, hardy climbers, but one species (and a good one too) requires the protection of a greenhouse. This is *Clematis indivisa*, a native of New Zealand; its white, starry blossoms, an inch or so across, are borne in great profusion in March. It is a free-growing climber, and for training to the roof or rafter of a greenhouse is most useful. *C. i. lobata* is a good form of it.

Cobæa scandens.—A very strong-growing climbing plant, suitable for clothing large spaces. The purplish-coloured, bell-shaped blossoms appear freely during the summer months. There is a pretty variety of this with variegated leaves.

Cockscomb. *See* Celosia.

Coleus.—A class of plants with prettily marked leaves, some of which form a pleasing feature in the greenhouse during the summer. They are of very easy culture, and cuttings strike readily in the spring in heat.

Cordyline australis is a plant of symmetrical growth, with long ribbon-like leaves. It is suitable for vases, pedestals, or prominent positions, as the long, arching leaves are then seen to great advantage.

Cyclamen persicum (*Persian Cyclamen*).—The forms of Cyclamen now in cultivation are endless, and the difference is not restricted to the flowers alone, as the leaves are richly marked. During the winter the Cyclamen is particularly valuable, and is obtained from seed sown in July. When large enough to handle, the plants must be potted singly into small pots, and shifted on when necessary. Pots five inches or six inches in diameter are large enough for them to flower in. Good flowering plants can be obtained in from fifteen to eighteen months from the sowing of the seed. After blooming, the old corms should be kept rather dry for a time, then, about July, they must be shaken clear of the old soil and repotted. A mixture of two-parts loam to one-part leaf-mould, with a fair sprinkling of well-decayed cow manure and sand, will suit the Cyclamen well. There is a pretty group with fringed flowers.

Cyperus alternifolius.—This is about eighteen inches high, the bright green stems being terminated by a quantity of long, narrow leaves, arranged like the ribs of an umbrella. There is also a variety with variegated leaves. Being nearly related to the Sedges, this Cyperus needs a copious supply of water.

Daphne indica.—This Daphne is a general favourite, because of the delicious fragrance of its flowers. It is a neat-growing little evergreen that flowers in the depth of winter. A mixture of loam, peat, and sand, and a shady position in the greenhouse, suit it well.

Echeveria.—Succulent plants of symmetrical growth, and near relatives of the House-leek. A prominent feature of some of the kinds is the metallic or bluish tint, while one, *E. fulgens*, has pretty nodding clusters of red and yellow blossoms.

Epacris.—The Australian representative of the Heath family, of which there are many distinct forms. They flower during the early months of the year, at which time the long shoots are thickly studded for some distance with pretty little tubular-shaped blossoms. In colour they vary from white to red, some of the pink tints being very pleasing. All the Epacris need very firm potting in sandy peat, and they may be placed out of doors during the summer months. Directly after flowering, the long shoots should be cut back to within a couple of inches of their base, and as soon as growth recommences the plants must be repotted. They will thus be well established before the time comes to turn them out of doors. In potting take care that there is good drainage, and in all stages of growth do not allow any extremes of drought or moisture at the roots.

Erica (*Heath*).—This is the Heath family, most of which are natives of South Africa, and though some of them are difficult to cultivate successfully, others may with care be grown in a satisfactory manner. They need much the same treatment as the Epacris just mentioned. Several of them are valuable for their winter flowers, notably *E. gracilis*, rosy-red; *E. caffra*, white; *E. hyemalis*, purplish rose; *E. hyemalis alba*, white; *E. melanthera*, blush; and *E. wilmoreana*, red and white. Among the easiest grown of the summer-flowering kinds are: *E. ventricosa*, pink; *E. ventricosa coccinea*, reddish-pink; *E. propendens*, purplish; *E. cavendishiana*, yellow; and *E. spenceriana*, blush. Though very chaste and beautiful, and with care they can be grown successfully, neither the Epacris nor the Ericas can be exactly recommended to the beginner, at all events till the rudiments of watering, potting, &c., are thoroughly mastered. Both are increased by cuttings, but it is a difficult matter, and successful only in the hands of skilled propagators. *E. hyemalis* is perhaps the most popular of the family.

Eucalyptus.—The Blue Gum (*E. globulus*) is naturally a large tree, but it is a well-known pot shrub. The peculiar bluish green of the leaves, and their warm aromatic fragrance, combined with the reputation it possesses as a febrifuge, all serve to render it popular. It is readily raised from seed, and the young plants obtained therefrom will make rapid progress in ordinary potting soil. A second kind, *E. citriodora*, has a pleasing lemon-like fragrance, but it is not so robust as the other.

Eulalia.—The Eulalias are a group of Japanese Grasses, valuable for decoration. The best is *E. japonica albo-lineata*, that reaches a height of two feet to five feet, the leaves being freely striped with white. It is a great favourite with the London floral decorators. In the second kind the leaves are transversely barred with yellow. Both succeed in ordinary soil, and are increased by division.

Ficus (*India-rubber Plant*).—The well-known India-rubber Plant is *Ficus indica*, which at one time was more generally grown than it is now. The tendency to lose its leaves at the base has led to such subjects as Palms, Aspidistras, and other things being more generally used for indoor decoration. The India-rubber Plant should be potted in a mixture of loam, peat, and sand, and the leaves kept regularly sponged. At the same time care must be taken not to put the plant in too large a

pot, as this often leads to many of the leaves dropping. Over-watering, too, must be guarded against. There is a form with variegated leaves, but it is not so effective or so robust as the commoner kind. In direct contrast to the huge leaves of the India-rubber Plant we have the tiny *Ficus repens* and *minima*, both of which are valuable for clothing a dark, damp wall in the greenhouse, as they will attach themselves to it in the way of Ivy, and render it green and attractive at all seasons.

Francoa.—There are two kinds of Francoa, both of which are pretty greenhouse plants. In *Francoa appendiculata* the long slender spikes are clothed with pinkish-red blossoms, and in *F. ramosa* they are white. Both are of easy culture, and readily increased by seed sown in the spring.

Fuchsia.—The Fuchsia is a well-known greenhouse plant, and is useful for outdoor culture during the summer. Cuttings of the young shoots strike root readily in the spring, and the plants so obtained may be grown in various ways. If their tops are pinched out two or three times when the plants are young they form neat bushes, next, allowed to grow at will with the leading shoot tied to a stake, they assume naturally more or less of a pyramid habit, while standards, which are admired by many, are formed by tying the plant upright, and removing all the side shoots until the required height is attained, when the upper portion of the plant which is to form the head may be allowed to branch out. Any attempt to form shoots on the lower part of the stem must be suppressed. Some of the more vigorous Fuchsias form a delightful feature when trained to the roof of a greenhouse, their pendulous, gracefully disposed blossoms being seen to great advantage under such conditions. Ordinary potting compost with a little liquid manure as the pots get full of roots is very suitable for the Fuchsia.

Gloxinia.—Given the same treatment as the Achimenes the Gloxinias will flower freely during the latter half of the summer, but to induce the plants to bloom earlier than that they need more heat. They are increased by seed sown in the spring, but as they require a warm structure during the early stages the better way for the beginner will be to obtain a few dormant tubers during the winter or early spring before they start into growth. Mixed seedlings (not named varieties) can be obtained cheaply.

Heath. *See* Erica.

Heliotrope.—This is known as Cherry Pie, from its fragrant blossoms. It is a very popular plant, as easily grown as a Fuchsia, and valuable for bedding out, or for growing as neat little bushes in the greenhouse, whilst a wall in that structure may be clothed with it. Few plants are more popular for that purpose.

Hibbertia.—The best of the Hibbertias is *H. dentata*, with pretty bronzy foliage, and bright golden blossoms a couple of inches across, borne during the first three months of the year. It is a valuable climber.

Hydrangea.—Though hardy in favoured districts the common Hydrangea, with its huge heads of pink blossoms, is a good greenhouse plant. By giving an occasional supply of a weak solution of alum water,

the flowers acquire a bluish tinge. The handsome *H. paniculata grandiflora* is much used for greenhouse decoration, although quite hardy. This shrub produces huge pyramidal-shaped heads of creamy-white flowers. The Hydrangeas strike root readily in the spring from cuttings of the young shoots treated much in the same way as a Fuchsia. The plants require copious supplies of water during the growing season.

Imantophyllum.—Sturdy growing plants with long, dark green strap-shaped leaves, and large heads of orange red or terra-cotta coloured blossoms, borne in the spring. The foliage is ornamental at all seasons. Seed frequently ripens, from which young plants are readily raised. *I. miniatum* is the full name. There are several good forms of it. It is surprising that more amateurs do not grow this plant.

Impatiens.—The best-known member of this extensive family is the common Balsam (*I. Balsamina*), which is popular either for the greenhouse or for bedding out. The seed should be sown in March, and the seedlings potted off as soon as sufficiently large. Pots six inches in diameter are a convenient size in which to flower the Balsam, which needs a good light soil, such as equal parts of loam, and well-decayed manure, with a little sand. Seed from good varieties is very necessary in order to obtain superior Balsams.

India-rubber Plant. *See* Ficus.

Indian Shot. *See* Canna.

Isolepis gracilis.—A pretty little grass-like plant, with dark green leaves that droop around the pot and almost hide it. For edging of groups and similar purposes it is very useful, and easily grown.

Jasminum.—The best greenhouse Jasmine is *J. grandiflorum*, a larger and bolder plant than the common hardy Jasmine, which it somewhat resembles. The white flowers, tinged with purple, are deliciously fragrant, and borne throughout the greater part of the year.

Joseph's Coat. See *Amaranthus tricolor.*

Kennedya.—Slender climbing plants, suitable for the roof or rafters of the greenhouse, with pea-shaped blossoms. The best is *K. Marryattæ*, which has scarlet flowers borne during the first half of the year.

Lantana.—Dwarf, shrubby plants, with flowers somewhat like those of the Verbena, but rather smaller. Lantanas will bloom throughout the summer, the flowers being white, yellow, pink, scarlet and crimson. These Lantanas can be recommended to the amateur, as they strike readily from cuttings in the spring, grow well with ordinary treatment, and flower continuously throughout the summer.

Lapageria.—The two Lapagerias—*alba*, white, and *rosea*, pink—are among the most beautiful of all greenhouse climbers, their flowers being bell-shaped, and of waxy texture. They need a well-drained soil, principally composed of rough sandy peat, copious supplies of water during the summer, and a position shaded from the sun. They are quite effective whether trained to the roof or to the back wall of the greenhouse.

Lemon Verbena. See *Aloysia citriodora.*

Lily of the Nile. *See* Richardia.

Lobelia.—The different forms of *Lobelia speciosa* are generally used for bedding during the summer, but at the same time they form a pleasing feature in the greenhouse, the loose-growing kinds being particularly useful for suspended baskets. Lobelias are readily raised from seed sown in the greenhouse in March. Miss Hope is a beautiful white variety for a basket.

Maiden's Wreath. See *Francoa ramosa.*

Marguerite.—This is the term usually applied to the different forms of *Chrysanthemum frutescens* that are largely grown for decoration. They succeed in any ordinary soil, and their large daisy-like blooms appear in great profusion throughout the greater part of the year. They all strike very readily from cuttings put in during the spring.

Maurandya barclayana.—A quick-growing climber that, if raised from seed in the spring, will produce its purple Foxglove-like flowers throughout the latter half of the summer.

Metrosideros floribunda. See *Callistemon salignus.*

Mignonette.—The delicious fragrance of the Mignonette (*Reseda odorata*) renders it a general favourite, and good plants of it are often grown in pots. Pretty little plants for autumn and winter flowering may be obtained in pots five inches in diameter, but the seed must be sown in July and August. A suitable compost is two-thirds loam to one-third well-decayed manure, with a little sand. The pots must be well drained, and the soil pressed down very firmly to within an inch of the rim. In sowing the seed take care not to sprinkle it too thickly, as five healthy plants are sufficient for one pot. A frame out of doors is a good place for the seed-pots, as the lights will serve to keep off an excess of rain, which must be especially guarded against. Plenty of air should be given, and as the plants develop a little liquid manure will be of service. A light position and a good circulation of air are necessary to the Mignonette in autumn and winter. There are several forms, the variety Machet being one of the best.

Mimosa. See *Acacia dealbata.*

Mimulus.—The garden forms of Mimulus, known as the Monkey Flower, are in many cases curiously marked. They grow readily from seed in the spring, and pretty little examples may be obtained in five-inch pots. The common Musk (*Mimulus moschatus*) is a general favourite, readily increased by division, as is also the larger-flowered form known as Harrison's Musk.

Monkey Flower. *See* Mimulus.

Musk. See *Mimulus moschatus.*

Myrsiphyllum asparagoides.—A slender climber, with small, bright shining green, heart-shaped leaves. It is the plant commonly known as Smilax, and has long sprays so much used for table decoration. It succeeds in ordinary potting compost.

Norfolk Island Pine. See *Araucaria excelsa.*

Ophiopogon spicatum variegatum, with white, striped leaves, and *O. Jaburan variegatum*, in which they are marked with yellow, are two dense-growing, grass-like plants, very pretty for indoor decoration.

Oxalis.—A dwarf class of clover-like plants, most of which spring from small tubers. The flowers of some of them are very pretty. *O. cernua*, with yellow flowers about the size of a shilling, is called the Bermuda Butter-cup, from the fact that it is extensively grown in Bermuda and sent to this country in early autumn. It is popular for the greenhouse. *O. Bowiei*, rose; *O. enneaphylla*, white; *O. Deppei*, reddish-purple; and *O. variabilis*, white and red, are among the best forms.

Palms.—Of late years Palms have greatly advanced in popularity, being now largely used for the stove and the greenhouse as well as for the dwelling-house, where some of them will keep in health for years, provided they get a reasonable amount of attention. Good loam, lightened by a little leaf-mould and sand, is suitable for the different Palms. Care should be taken not to give too much soil, for good specimens may be grown in comparatively small pots. They must never be allowed to suffer from drought, though stagnant water is very injurious. It is important to keep the leaves sponged with tepid water regularly. The best greenhouse Palms are:—*Areca Baueri*, *Areca sapida*, *Chamærops excelsa*, *Fortunei*, and *humilis*, *Corypha australis*, *Kentia belmoreana*, and *K. fosteriana*, *Latania borbonica*, *Phœnix canariensis*, and *Rhapis flabelliformis*.

Passiflora (*Passion Flower*).—Well-known climbers, flowering principally during the summer months. *Passiflora cærulea*, blue; P. Constance Elliott, white; *P. Lawsoni*, light purple; and P. Imperatrice Eugenie are all good. These strike from cuttings in the spring.

Pelargonium.—Owing to the many sections of Pelargonium now in cultivation they form a most extensive class, and the uses to which they can be put are varied. At one time the name of Pelargonium was, at least from a popular standpoint, applied only to the large-flowered show section, the term Geranium being generally used to indicate the Zonal, Ivy-leaved, and others of this class. The Zonal Pelargonium or "Geranium," as it is popularly called, is represented by numerous varieties with flowers varying from pure white to crimson. This plant can be put to many uses. It is admirably adapted for the greenhouse or conservatory, and if the structure be kept at a temperature of 50 degrees to 60 degrees the plant will flower throughout the winter. It is largely used for bedding out during the summer months, while large, old plants will yield a wealth of blossom if planted out of doors at that period, as one may see from the noble specimens put out for the summer in the London parks. There are now a great number of double-flowered varieties belonging to this Zonal section. These are valuable for flowering in pots, but as a rule they do not bloom with the same freedom as the single kinds if bedded out.

Ivy-leaved Pelargoniums.—The members of this section have become very popular within the last few years, and the double-flowered forms are now universally grown. Some of them are valuable for clothing the pillars or back wall of the greenhouse, while for hanging baskets they are largely used. Their drooping habit fits them for window-boxes, the margings of large vases, and similar purposes, while

secured to a few sticks they form neat little bushy specimens for the greenhouse.

The large-flowered Pelargoniums are now classed under the different heads of Show, Spotted, French, Regal, and Decorative, but no hard-and-fast line can be drawn between these groups. The fancy varieties are known by their slender yet dense growth and profusion of small flowers. Scented foliage kinds form a distinct class, the flowers, as a rule, being insignificant, but the prettily-cut, highly-fragrant leaves render them popular, especially where the old-fashioned nosegay is still in demand. These are handsome in large tubs or pots for the terrace in summer. Variegated-leaved varieties, principally of the Zonal section, are numerous, but they are more used for bedding out during the summer than for the greenhouse.

The Pelargonium is increased by cuttings, a subject dwelt upon in a previous chapter. With regard to soil, a mixture of two-thirds loam to one-third well-decayed manure or leaf-mould, or a mixture of both, with a sprinkling of rough sand will suit them well. In all stages of growth a good light position and free circulation of air are necessary, as a stagnant atmosphere will soon cause many of the leaves to turn yellow and drop. During winter the roots may be kept as dry as is consistent with safety, and the plants so treated will start into growth in the spring more readily than those that have been kept excited throughout the winter season. Aphides or green-fly are particularly troublesome to some sections of Pelargonium, but they may be easily kept down by using the XL-All Vaporiser.

Zonal Pelargoniums for winter-flowering should be grown throughout the summer in a spot fully exposed to the sun, and pick off the flower-buds until the autumn. The varieties of Pelargonium are almost innumerable, hence a selection of names is difficult to give, and better results will be obtained by inspecting a good collection during the flowering season, or by obtaining the catalogue of a well-known Pelargonium grower.

Petunia.—The Petunias form a pretty class of soft wooded plants. Both single and double flowers occur amongst them, the single kinds being useful for bedding out, for balconies, and for window-boxes, while they also form a pleasing feature in the greenhouse. The double flowers are too heavy for the outdoor garden, but for growing under glass they are very showy. The single kinds are readily increased from seeds sown in the greenhouse in the spring, but the choicer double kinds are propagated by cuttings. Given the same treatment as a Fuchsia they strike root readily. Ordinary potting compost will suit them well. Petunias are easily grown.

Plumbago capensis.—This is a charming plant for training to the roof of a greenhouse, in which position its delightful porcelain blue blossoms are produced throughout the summer months. As a bush, too, it is equally as attractive. There is a white-flowered variety, but it is not so pleasing as the ordinary form. The Plumbago is as easily grown as a Fuchsia, and needs much the same treatment.

Primula.—The Chinese Primula is one of the most popular of

THE "STAR" PRIMROSE (PRIMULA STELLATA).

greenhouse plants in winter and spring. The seed should be sown about midsummer, and as soon as the young plants are large enough to handle they must be pricked off. Then pot them singly into small pots, and as these get full of roots the plants may be shifted into pots five inches in diameter, in which they will flower until the end of September. A cold frame is better than the greenhouse, but before autumn frosts set in they should be removed indoors. The double-flowered varieties are increased by surrounding the stem with a mixture of moss, loam, and sand, into which they will root, and as soon as they are sufficiently advanced the plant may be divided and the several pieces potted. The propagation of double Primulas requires considerable care. With regard to the single varieties, unless they are needed for seed the plants may, after flowering, be thrown away, as young plants give better results than old ones. A good soil for the Chinese Primula is two-parts loam to one-part each of leaf-mould and decayed manure, with a liberal sprinkling of silver sand. In all stages of growth the watering of these Primulas must be carefully done, as an excess of moisture or of drought is equally fatal. Pretty semi-double flowers can be readily obtained from seed if it is saved from a good strain. Besides this, several other Primulas are valuable for the greenhouse, notably, the Auricula, which blooms in the spring, the Japanese *P. cortusoides Sieboldi*, of which there are many pretty varieties, flowering at about the same period, and

Primula floribunda, which produces its pretty golden blossoms almost throughout the year, while the sulphur-coloured *P. verticillata sinensis* flowers in the spring. A continuous blooming form is the pretty mauve-coloured *P. obconica*, which has led to much discussion at different times owing to its leaves when handled in some cases causing an irritation of the skin, while others who handle it are quite unaffected by it. The Star Primula (*P. stellata*) is a name applied to a very graceful form of the Chinese Primula; it is quite a break away from the ordinary kind. It is taller and more slender in growth, the whole plant being far more elegant than the ordinary Chinese Primula.

Rhododendron.—This is a large group of beautiful flowering shrubs, many of which do not flower until they have grown to a considerable size. Some of the hybrids, however, flower well in a small state, among the best being Countess of Derby, Countess of Sefton, Duchess of Sutherland, Lady Alice Fitzwilliam, and Princess Alice. All of the above have large white or blush-coloured and very fragrant flowers. These Rhododendrons need the same treatment as their near relatives the Azaleas. All of them flower during the spring months.

Richardia.—The most popular of the Richardias is the Arum Lily (*R. æthiopica*), also known as the Lily of the Nile. It has very handsome white trumpet-shaped spathes, which are in great demand for wreaths, vases, and similar purposes. The foliage, too, is conspicuous, and good plants form a striking feature in the greenhouse. The flowering season varies according to the treatment given, but in a general way these big white spathes are most appreciated in winter and early spring. To obtain them stand the plants out of doors during the summer, and keep them dry for a time. Then about the middle of July shake them

clear of the old soil and repot in a mixture of loam and decayed manure, after that giving more water and keeping them out of doors until the autumn frosts threaten danger. It must be borne in mind that the Arum Lily grows naturally in ditches in South Africa, hence a liberal supply of water is essential, except when actually at rest. There is a miniature form known as Little Gem, which is not so free as the type. Two golden-flowered Richardias have been introduced into cultivation of late years, but they need more careful treatment than the Arum Lily. They pass the greater part of the winter in a quite dormant condition, flower in the spring, perfect their growth, and early in autumn go to rest, at which period they must be kept quite dry.

Ricinus.—This is the Castor Oil Plant. Its large, divided leaves make a good show either in the greenhouse or bedded out during the summer months. The plants are readily increased by seeds sown in heat in the spring.

Roses.—The culture of the Rose in pots is dealt with in a special chapter.

Salvia.—The best of the Salvias are quick-growing plants that may be placed out of doors during the summer, and treated much in the same way as the Chrysanthemum. They flower during the autumn and early winter. A selection would include:—*S. Bethelli*, pink; *S. Pitcheri*, blue; *S. rutilans*, red; and *S. splendens*, scarlet; the last-mentioned is a most effective plant, and should be grown more frequently.

Scarlet Geranium. *See* Pelargonium.

Schizanthus.—Pretty annuals, the markings of the flowers suggesting those on the wings of a butterfly. Sow the seed in gentle heat early in the spring.

Slipperwort. *See* Calceolaria.

Smilax. *See* Myrsiphyllum.

Solanum.—The bright red berries of *Solanum capsicastrum* render this a favourite plant for decoration throughout the winter months. It is readily raised from seed early in the year, and when finally potted into five-inch pots may be placed out of doors during the summer, as in this way it will flower and set its berries freely. A climbing kind—*S. jasminoides*—will produce its pretty white flowers throughout the greater part of the year in the greenhouse. In mild countries, as in the south of England, it will stand the winter in the open.

Thunbergia alata is a delightful trailing plant, of which there are several forms, the showiest being of a rich yellow colour with a dark throat. It is an annual easily raised from seed in the spring, and for growing in suspended baskets has few equals.

Torenia.—Procumbent growing plants seen best when treated as recommended for the Thunbergia. There are several sorts, but none superior to *T. Bailloni*, yellow; and *T. Fournieri*, purple. The flowers are charming in colour.

Tropæolum.—The climbing Tropæolums are very pretty, and the Lobbianum section will succeed almost anywhere. Good kinds are:—Ball of Fire, scarlet; Clapham Park, orange; Hermine Grasshof, orange, scarlet, double; and Coolgardie, yellow.

Yucca aloifolia variegata.—A stately growing plant with long narrow symmetrically disposed leaves, each of which terminates in a sharp spine. The leaves are striped with creamy white.

BULBOUS FLOWERS FOR THE GREENHOUSE

Many hardy bulbous plants are valuable for the greenhouse during the early months of the year. They flower naturally in the spring, and when given the protection of a glass structure and a little heat, can be obtained in flower in many cases soon after Christmas. Under this head are included Hyacinths, Tulips, many kinds of Narcissus (Daffodils), *Scilla sibirica*, Chionodoxas, and Snowdrops. The bulbs can be obtained during the autumn, and all need much the same treatment. Pots five inches in diameter are the most convenient, and unless for special reasons the better way will be to use this size. The pots must be thoroughly drained, but at the same time no more broken crocks should be used than are absolutely necessary. One bulb of a Hyacinth should be placed in a five-inch pot. With regard to Tulips, as a rule five or six will be sufficient, Narcissus from three to five, *Scilla sibirica*, eight or nine, Chionodoxas and Snowdrops the same. They should all be potted at such a depth that the bulb is completely covered. Then after potting, stand them out of doors on a firm bottom of ashes, give a good watering, and cover all with cocoanut fibre refuse or ashes, sufficient being used to just hide the pots entirely. This maintains an even state of moisture around the bulbs, a condition particularly favourable to the formation of healthy roots, without which bulbs will not flower well. In a month or so the pots will be full of roots, and they may be taken into the greenhouse at any time from then to Christmas. Where a succession of flower in the early months of the year is desired, the pots must not be taken into the greenhouse all at once, but at intervals of a week or so. They must be freely supplied with water, not saturated, but sufficient given to keep the soil moist, as if allowed to get dry they seldom flower well. A suitable soil is one-third each of loam, leaf-mould, and well-decayed manure, with a sprinkling of sand, and the whole thoroughly mixed together. In some cases a little support will be needed as the flowers develop, and the beauty of the plant depends upon this being neatly done. Thus the sticks should be as slender as possible, consistent with supplying the proper support, while the ties should not be conspicuous. In tying Hyacinth spikes, or in fact

any other bulbs, it is important that the material used should not be drawn too tightly, as the stems swell and lengthen rapidly, hence they will be soon crippled unless constantly attended to, whereas if ample room be allowed, no damage will result. The little, pure white Roman Hyacinths which are grown in Italy and the South of France, reach this country at the end of July and in August, and if potted early they will flower in November and December.

A selection of good Hyacinths is as follows :—

Single White. Alba maxima, Avalanche, Grand Vainqueur, Grand Vedette, Grandeur à Merveille, Mont Blanc, White Perfection. *Single Red:* Baron Van Tuyll, Cavaignac, Charles Dickens, Lord Wellington, Macaulay, Norma, Robert Steiger. *Single Blue:* Argus, Charles Dickens, Czar Peter, General Havelock, Grand Lilas, King of the Blacks. *Single Yellow:* Bird of Paradise, City of Haarlem, Ida, King of the Yellows, Sovereign.

Double White: Bouquet Royal, La Tour d'Auvergne, L'Adorable, Prince of Waterloo, Princess Louise. *Double Red:* Bouquet Royal, Grand Conquerant, Lord Wellington, Sans Souci. *Double Blue:* Blocksberg, Duke of Norfolk, Lord Raglan, Sir Joseph Paxton, Thomas Moore.

Tulips most adapted for pot-culture are: Duc Van Thol in all its varieties, as they are dwarf and flower early; Belle Alliance, scarlet; Bride of Haarlem, white, flaked crimson; Canary Bird, yellow; Cottage Maid, pink, marked white; Duchesse de Parme, orange red, margined yellow; Dussart, crimson; Grand Duchess, white; Keizer Kroon, scarlet, edged yellow; King of the Yellows, deep yellow; Pottebakker, scarlet, white, and yellow; Queen of the Netherlands, rose; Queen of Violets, light purple; Rose Grisdelin, pink and white; Scarlet Beauty, scarlet; Thomas Moore, orange; Van der Neer, purplish-violet. The above-mentioned are all single, a few good double kinds being: Duke of York, rose-edged white; Imperator Rubrorum, scarlet-crimson; La Précoce, white; Murillo, rose; Tournesol, red and yellow; Velvet Gem, bronzy-crimson.

The **Narcissus** (Daffodil) forms an extensive family. A selection of the best for pots is: Bicolor Emperor, Empress, princeps, maximus, telamonius plenus, Barri conspicuus, incomparabilis fl. pl., aurantiacus fl. pl., Sir Watkin, Stella, Burbidgei, poeticus ornatus, poeticus fl. pl. (the Pheasant's Eye) and the various Polyanthus Narcissus, such as Bazleman major, Grand Monarch, Paper White, Soleil d'Or, Scilly White, and States-General; with the Chinese Sacred Narcissus or Joss Flower, which will flower beautifully in a bowl of water, with a few stones to hold it in position.

The Lily of the Valley (*Convallaria majalis*) is a universal favourite, and though considerable heat is necessary to flower it early, unless in the case of retarded crowns, it will, if brought on in the greenhouse, bloom much earlier than plants in the open ground. Its

white fragrant bells are always welcome. The retarded crowns alluded to are those that have been kept in a refrigerator until long past their flowering period, and consequently they grow and flower quickly when placed under favourable conditions. For the earliest flowering the best are Berlin crowns, while the Dutch clumps are preferred for later blooming. The last are in the shape of a rounded mass of roots and soil thickly studded with flowering crowns, and all that is needed is to pot them, place in the greenhouse, and keep well supplied with water. Good home grown clumps are quite as satisfactory as the imported ones.

Gladiolus.—The early-flowering Gladioli are very pretty in the greenhouse, as if half-a-dozen bulbs are potted in a six-inch pot, in the same soil as recommended for Hyacinths, &c., they will flower in early summer. The best are: The Bride, pure white, which in many places is grown in thousands for cutting from; Adonis, orange-scarlet, blotched white; Colvillei, rosy-purple; Delicatissima, white-blotched crimson; Emperor William, purplish-scarlet; Prince Albert, salmon-scarlet; Queen Victoria, deep red, marked white.

Crinum Moorei has huge club-shaped bulbs and spikes of white flowers borne in August. The plants will stand for years in the same pot, and flower every season; they may be placed out of doors when spring frosts are over until the flower spikes make their appearance.

Freesia.—A charming group of greenhouse flowers, very fragrant, and now that their culture is better understood, becoming more popular. The pure white flowers, except for a yellow stain in the centre, are borne in branching panicles. The best bulbs are grown in the Channel Islands, and reach here in the dormant state early in August. They should be potted at once, eight bulbs in a pot five inches in diameter. Two-thirds loam to one-third leaf-mould and a little silver sand will suit them thoroughly. In potting keep the bulbs well covered with soil, that is to say, half an inch of soil over the top of the bulb. While growing they need a light and airy position in the greenhouse, where they will bloom about March. After flowering they must be supplied with water until the leaves turn yellow, and when dormant shake them quite free from the old soil, sort the bulbs, and again pot them.

Ixias.—Crocus-like bulbs that push up tall wiry stems, terminated by spikes of bright-coloured blossoms. One of them, *Ixia viridiflora*, always attracts attention, as the flowers are of a beautiful metallic green with a dark centre. Ixias should be potted half-a-dozen in a five-inch pot in early autumn.

Lachenalia.—Small growing bulbs that require to be potted in August, and will flower in the spring. They are very pretty either grown in pots or in suspended baskets. The best are: *L. aurea*, yellow; *L. Nelsoni*, rich golden yellow; *L. pendula*, red and yellow; and *L. tricolor*, green, red, and yellow. *Nelsoni* is the one to select; its flowers are produced on a sturdy stem, and are quite butter yellow.

Lilium.—The best Lilies for greenhouse culture are *L. longiflorum* and its varieties, notably *Harrisi*, all of which have pure white, long, trumpet-shaped flowers; *L. auratum* in its several forms; and *L. speciosum*, of which there are both white and coloured kinds. The

bulbs should be potted in the autumn and grown throughout in a light airy position to keep them as sturdy as possible.

Nerine.—The best known of this class is the Guernsey Lily (*Nerine sarniensis*). It throws up a spike about a foot high, which bears a head of bright carmine rose-coloured flowers. In *N. Fothergilli* and *N. corusca major* they are of glowing scarlet. These flower in autumn, grow throughout the winter, die down towards the end of spring, and rest during the summer, when they should be kept quite dry and fully exposed to the sun. A soil principally composed of yellow loam and sand, lightened if necessary by a little leaf-mould, will suit them well. They seldom need repotting. The Nerines form a delightful group of plants, bright and showy.

Tuberose.—The Tuberose is generally regarded as a bulb for forcing, but it will grow and flower in the greenhouse, though, of course, its rate of progress is slower than when more heat is given. The flowers are pure white, and very fragrant, a heavy drowsy perfume. A mixture of loam, leaf-mould, with, if possible, some well-decayed manure and sand, suits the Tuberose. Before potting, remove all offsets, as they weaken the flower spike. The greater part of the bulb should be covered, and care taken not to give too much water until the roots are active. When in full growth, a little liquid manure about every ten days is beneficial. Pots five inches in diameter are suitable for the Tuberose bulbs.

Vallota purpurea.—This, known as the Scarborough Lily, is a great favourite in this country, and during August and September it is welcome in the greenhouse. The large reddish-scarlet flowers are borne in a good-sized head on a stem a foot or so high. It is a native of South Africa, and needs the same treatment as given above for the different Nerines. The bulbs frequently flourish in quite cottage windows. The secret is not to disturb the plant too often; the finest display is usually given by bulbs which have not only filled the pot but are almost bursting it.

Besides the plants mentioned there are many bulbs that require a greenhouse, as if at all exposed to frost they perish. A selection of the best of these would include: Amaryllis, also known as Hippeastrum. A class of plants with strap-shaped leaves, and large showy flowers, produced during the first three months of the year. After this they complete their growth, rest during the winter, when they should be kept dry, and when watered early in the new year the flower spikes quickly appear. The large Lily-like flowers vary in colour from almost pure white to rich glowing crimson.

A GROUP OF LARGE-FLOWERED CHRYSANTHEMUMS

THE CHRYSANTHEMUM

FEW flowers are more valuable to the beginner in gardening than the Chrysanthemum, and its culture has increased amazingly, until in every town almost in the British Isles, the Chrysanthemum show is an event of some importance in the autumn months. Of course in the land of the Japanese and Chinese the flower is held in great esteem, and in Japan the Chrysanthemum fête is one of the high festivals of the year. Varieties that create sensations in the show tents have been raised of late years, and the flowers seem to increase in bulk as the years go by, until in the near future no soup plate will hold the long, frequently picturesque, florets. Even quite a small grower may win prizes at the exhibitions, and "showing" is popular at the present day. Those who care little for monster specimens may enjoy a feast of blossom at little expense of time, labour, and money. Growing plants for exhibition requires considerable skill, a thorough acquaintance with the most recently raised varieties, and ample leisure, but those desired merely for the greenhouse, conservatory, or border, are easily managed. As the following notes show, the Chrysanthemum is divided into many groups :—Japanese, Japanese incurved, Japanese reflexed, incurved, pompon, Anemone pompon, Japanese pompon, reflexed, single, and even other divisions. We are pleased to find that raisers are giving much attention to the raising of outdoor varieties of good rich colours. In the late days of August, throughout September, and a part of October, Chrysanthemums give colour to the border or flower-bed, and with the assistance of such fine old kinds as Cottage Pink, their season is continued far into the autumn.

How to Obtain Good Cuttings.—The best cuttings are those which develop at the base or crown after the plants have finished flowering and been cut back. It is usual to cut back plants to within a few inches of their base, making an exception in the case of those somewhat shy in the production of cuttings. The reason for leaving a greater length of stem in such cases is that cuttings frequently develop on the stem and must be detached. A good rule with show plants is to shake them out of their flowering pots, then reduce the ball of earth sufficiently to re-

pot them in a pot measuring six inches in diameter. Use some light gritty compost, and avoid too firm potting. After repotting give each plant a watering in, using a fine-rosed can for the purpose. Stand the plants on a shelf near the glass roof of the greenhouse, and if this is not possible, on the greenhouse bench, maintaining a temperature of between 45 degrees and 50 degrees. In a short time a fresh lot of shoots should be developing on the plants, and cuttings of this kind are those best calculated to give satisfactory results. Where large quantities of cuttings are required, after shaking the old plants out of their flowering pots, reducing the ball of earth, and at the same time cutting back some of the longer and coarser roots, replant them in a bed of soil made up on the greenhouse bench. This bed of light gritty soil should be from six inches to eight inches deep and the plants not too firmly bedded out. An even surface should be made, so that when watering the water should be retained and not run off on either side, as is the case unless this simple rule be observed. The same temperature should be given in this case as that advised for plants in pots. Within a period of ten days to a fortnight the cuttings should be developing in large numbers. The soil should be kept just moist, neither too pasty nor too dry. Some may not care to treat their old plants in this way; the trouble is too great. If so, cut out any attenuated shoots of comparatively recent growth, also weakly ones. Although the early-flowering varieties appear strong, they are often among the first of the old plants to suffer, and when such is the case their only chance is either to repot them or plant them out on the greenhouse bench—the two methods of increasing the supply of cuttings.

GOOD TYPE OF CUTTING, SHOWING SHOOT OF FREE GROWTH

The Best Cuttings.—The best, and in truth the only good, cuttings to be obtained are those which push their way through the soil at some distance from the old stem. These are of recent growth, and generally go ahead immediately they become rooted. The other form of cutting is produced close to the old stem, and often develops on the stem itself. Varieties rather shy in producing cuttings often have to be perpetuated by stem-cuttings. This kind should not be too long, a desirable length being between two and a half inches and three inches.

It should be detached from the old shoot with a sharp knife, and cut straight through immediately below a joint formed by the junction of the leaf-stalk with the stem. The bottom leaf should be removed by the sharp knife also, trimming this off close to the stem of the cutting. This is then ready for inserting in the propagating frame. Stem-cuttings are not advisable, as they are apt to develop buds prematurely, and in consequence completely upset a proper system of high culture, besides causing much inconvenience during their period of propagation.

Propagation by Cuttings.—The period for the propagation by cuttings depends upon when the grower requires his plants in flower. If the object be simply large flowers for exhibition, the earlier the work is taken in hand the better. Cuttings of Japanese sorts for this purpose should be inserted in December. The late-flowering Japanese are better if attended to earlier, even in November, while those kinds liable to blossom earlier than the majority, namely, mid-October and late October, give excellent results if the cuttings are put in late in January. The object in varying the date of propagating the exhibition varieties is to insure the plants flowering for the most part at the same time, namely, when the shows are taking place all over the country. The earlier half of November is Chrysanthemum show time, and for this reason, by propagating the later sorts early and the early varieties late, the plants will bloom about one time. Cuttings intended to produce exhibition plants should be inserted singly in what are known as "thumb" pots, and if deep "thumbs" can be obtained so much the better. Wash the pots quite clean, and soak new pots in clean water to absorb moisture. The broken potsherds should also be cleansed, and this is work that must not be neglected. It is by observing such details as this that success is assured. In raising plants for the conservatory, for use also as cut flowers, or for planting in the outdoor border for a rich autumn display, a simpler method of propagation will answer. Half-a-dozen or more cuttings may be inserted around the edge of a three-inch pot or a larger number in those of increased size. Boxes about two inches deep, fifteen inches long, and ten inches wide, are excellent for raising large stocks of plants. Another method, and one largely adopted by market men, is that of making up shallow beds inside the cool greenhouse, where a cool bottom can be obtained, and inserting the cuttings in these. Under these circumstances, provided the soil is not allowed to become too moist, failure is almost unknown, and it is remarkable how quickly the cuttings root. Both in the case of boxes and the beds arranged on the raised sides of the greenhouse, a system of drainage

BAD TYPE OF CUTTING, SHOWING BUD AT ITS APEX

should be observed. Potsherds and pieces of fibrous turf answer the purpose admirably, keeping the drainage open, and the soil sweet.

The compost for the cuttings should be fibrous loam, well-decomposed leaf-mould, and coarse silver sand or road grit in equal proportions. Before these ingredients can be used, pass them through a sieve with a half-inch mesh, and mix them thoroughly afterwards. The residue—the fibrous tufts of loam and the coarser and less decayed portions of the leaf soil—should be taken care of, as this material will be wanted. When the soil is ready place a small piece of crock over the hole in the bottom of the pot, and cover this with a layer of smaller pieces. Cover the crocks with a small layer of the rougher siftings of the compost referred to, filling in the soil afterwards to the rim of the pots, and giving the latter a sharp rap on the potting bench to settle the soil rather firmly. A pinch of silver sand should be placed on the soil in the centre, and then with a cedar-wood pencil, or anything similar in shape, make a hole, carrying down the sand when making it, the hole to be of sufficient depth to bring the joint of the first leaf-stalk of the cutting on the surface of the soil. The cutting is less likely to fail when the base of the cutting rests upon the soil. Press the soil firmly at the base of the cutting, at the same time giving pot and soil a gentle rap on the potting bench. Label each cutting as it is finished, noting the date of the operation, which may afterwards prove instructive. Go through all the cuttings in this way until they are completed. When inserting the cuttings in pots, boxes, or on the greenhouse bench, keep them two inches apart, and three inches between the rows. Should the compost be fairly moist no water will be required for some hours. When it is applied give a thorough soaking from a fine-rosed can.

Best Place for Propagating.—The custom in most gardens is to place the pots and boxes containing the cuttings in a cold frame outdoors. The pots, &c., should be plunged in ashes, cocoanut fibre refuse, spent hops, and any similar substance, thus keeping the soil in the pots moist, and also affording protection should severe and prolonged frosts prevail. Stable-litter or bracken should be packed round the sides of the frame to render it more frost proof. The material inside the frame should be of sufficient height to raise the pots well up to the frame-light, so that when the cuttings become rooted the young plants are not drawn and weakly. In frosty weather cover the frame-lights with a few layers of mats, and frosts of more than ordinary severity may be kept out by covering the frame-lights with a kind of thatch made of straw or bracken. The cuttings or young plants suffer, and sometimes damp off through being covered up. This is the case when the weather continues hard for many weeks. On fine and mild days the frame-lights may be slightly tilted to insure ventilation.

To raise plants quickly, and with little risk of failure, place a small frame on the greenhouse or conservatory bench, and plunge the pots in this in the same way as advised for frames outdoors. The temperature of the glass structure should be between 40 degrees and 45 degrees, but never exceed the latter figure. Packing round the frame with litter, &c., is unnecessary in this case, the hot-water pipes maintaining a suitable

temperature and anxiety regarding frosts removed. Those who do not possess a frame of suitable dimensions, may easily and quickly erect a temporary one. Put ten-inch planks, about an inch in thickness, cut to any size or shape, together, and keep the boards secure and upright. Laths should be nailed across the frame, and fixed in such a way that sheets of glass may be arranged upon them to form a kind of frame-light. These sheets of glass may be removed at will, and any given plant or number of plants inspected with ease. Within a month many of the cuttings will have rooted, and they may then be taken from the propagating frame to another structure, or temporary frame, without delay.

Treatment of Young Plants.—Place the rooted cuttings, or what may now be called "young plants," in a rough frame on the greenhouse bench, and construct this in a similar way to the one used for propagating described earlier. Put the pots on cocoanut fibre refuse or sifted ashes, and give each one sufficient space for air to circulate freely around. The frame must be carefully ventilated at first, gradually increasing the ventilation so as to prevent a sickly growth. In a comparatively short time the young plants will bear full exposure to the greenhouse without flagging, and forthwith continue to grow. The more forward plants when sufficiently hardened may safely be placed on the shelves of the greenhouse near to the glass; this will keep them sturdy and stocky. It is a mistake to stand the pots on the bare boards of the shelves, as with the lengthening days after the turn of the year, accompanied with short periods of bright sunshine, the soil quickly dries, and unless one is constantly on the alert many of these young Chrysanthemums receive a serious check. It is a good rule to spread a layer of cocoanut fibre, or any other substance answering the same purpose, on the shelves, first standing the plants on this material. By these means the air is kept cooler than would otherwise be the case, consequently less water is required. Until the whole of the cuttings are rooted, they must be constantly shifted from one structure to another before hardening them off. Ventilate as occasion offers, and special pains must be taken to keep the temperature at about 45 degrees or the plants will become drawn. As the days get warmer admit air more freely, and as soon as the cuttings become rooted in the frames outdoors give ventilation upon all favourable occasions. Advantage must be taken of fine days to increase the supply of air. Plants raised in this way are often sickly in the early season, but by judicious ventilation and careful water-supply an alteration soon occurs.

First Repotting.—As soon as the young plants have filled their small pots with roots shift them into those of larger size. Those, too, which were rooted around the edge of small pots and also propagated in boxes, should receive similar attention when well rooted. Repot plants rooted singly in "thumb" pots into those measuring three and a-half inches across, and known as large sixties. Small sixties—pots three inches in diameter—will suffice for the others, and on this account prepare them in good time. It is a good rule to prepare for the next operation as the last one is finished. The pots and crocks should always

be cleansed when dirty, and new pots soaked in clean water. The compost for the first repotting should be as follows:—Three-parts fibrous loam, one-part thoroughly rotted manure, and one-part good leaf-mould. To this add half a part of coarse sand or road grit and a dusting of wood ashes or crushed charcoal. Pass the first three ingredients through a coarse sieve, and pull the pieces of fibrous matter apart as far as possible. Then thoroughly mix the whole of the ingredients, and when completed all will be ready. Begin first with the plants which give evidence of being well rooted, and rather defer the potting up of any plant for a day or two than shift it into a pot of larger size before it is ready. Crock with care, covering these with the rougher siftings, which form an admirable drainage, and also prevent the soil clogging the crocks. Turn each plant out of its pot, removing the crocks from its base so as not to damage the tender roots. A layer of soil should cover the drainage material just referred to, and on this place the ball of the repotted plant evenly. Work in the compost between the ball of the repotted plant and the pot, using a stout label for the purpose, or any flat piece of wood about an inch and a-half wide and half an inch thick. Ram the soil in firmly with this simple arrangement, and if the pot be rapped occasionally on the potting-bench during the process of repotting, keeping the thumbs on the surface of the ball of earth at the same time, the soil settles down firmly and the operation is complete. The surface of the ball must be sufficiently below the rim of the pot to allow water to be given. When removing the rooted cuttings from the pots and boxes, disturb the roots as little as possible. After the first repotting remove the plants to a temporary frame for a few days, gradually inuring them to the more airy conditions of the greenhouse. They may then be placed on the shelves near the glass, and kept growing steadily until they are removed into frames outside.

Placing Young Plants in Cold Frames.—Early March is a good time to place the earliest plants which were raised in the cool greenhouse outdoors in cold frames. Of course, this depends in a large measure upon the weather. However, when it is possible to do this work, stand the plants on ashes, not pot to pot, and keep them well up under the glass to promote sturdy growth. Admit air carefully, taking advantage of fine days to give a more abundant supply. Avoid draughts from the cutting easterly and north-easterly winds, which quickly interfere with the plants' progress. As the season advances more air may be given, until on fine days in early April, the frame-lights may be removed.

Standing Plants in the Open.—In the south of England, where a sheltered position can be provided, stand the plants outdoors in the middle of April, and if the aspect be a warm one—say, south or west—and protection can be afforded from the cold winds from other quarters, no better place could be chosen. Where the situation is low and damp delay from a week to ten days later before putting out the plants in the open. In the Midlands make the date for placing them out doors a week later than that first mentioned, and in the North the first week in May is the time to insure safety.

SINGLE-FLOWERED CHRYSANTHEMUMS.

Subsequent Repottings.—By early April a second repotting will be needful, and if the plants can be well established in these larger pots before they are placed outdoors so much the better. The plants in large sixties (three and a-half inch pots) should be potted up into thirty-twos (six-inch pots), and those in small sixties (three-inch pots) into forty-eights (five-inch pots). Spread this operation over some time, as the plants are not all in the same condition, and will therefore need repotting much earlier than those of a less vigorous growth. In this case also see that the pots and crocks are scrupulously clean. For this shift the compost must be richer and more lasting, the following ingredients meeting their requirements at this somewhat early season. Of good fibrous loam, by no means heavy or retentive, take four parts, one-part well decayed leaf-mould, and one part of horse droppings, prepared as for a mushroom bed. To these add a third-part of coarse sand or road grit, a third of a part of crushed oyster shells, and, in addition, a liberal sprinkling of bone-meal and any well-known concentrated manure. The heap should be well mixed, turning it over repeatedly until quite satisfied that each of the ingredients is evenly distributed. In this case it will not be necessary to pass the compost through a coarse sieve, but pull the larger pieces of turfy loam into pieces about the size of a walnut. Crock and pot with increasing care, rendering the soil firmer at each repotting. Cover the crocks as before with the rougher portions of the soil, and when placing the plant in the new pot, keep the surface of the ball of earth well below the rim of the pot. Ram the compost in firmly, otherwise the aftergrowth will be poor. Stand the plants when repotted in a somewhat shady place, allowing them to remain there for a few days, or until they have recovered from the check. When the soil is just moist no water will be needed by the repotted plants for a day or two, unless one is much drier than another. A few hours before repotting the plants water them thoroughly. When watering of the repotted plants is necessary give them a copious supply to insure the whole of the soil becoming thoroughly moistened. In the course of a few days the plants may be placed in the open in double rows, standing them on boards or a very thick layer of ashes or coke breeze. Place a small hazel stake in each pot to support the plant, the latter being lightly looped to the stake, and not tied tightly as is so often the case. They may be left thus until the final potting is necessary.

Final Potting.—Chrysanthemums are usually placed in their flowering pots during the early summer, but this operation entirely depends upon the condition of individual plants. This final potting is an important cultural detail, and to achieve success pay special attention to the preparation of the compost. This should be composed as follows:—Four-parts good fibrous loam, one-part leaf-mould, half a part of horse droppings, prepared as for a mushroom bed, and a sixth of a part each of wood ashes, or crushed charcoal, and crushed oyster shells. A free sprinkling each of some good concentrated manure, such as Clay's, and a similar quantity of quarter-inch bones, will promote vigorous growth; but as the plants are to remain in these pots for five or six months at least, a lasting compost is, of course, essential. The compost

must be well mixed, turning the heap over repeatedly each day for a few days, and keep the mixture outdoors. In the meantime the pots for this final shift should be got ready, washed inside as well as outside, and the potsherds cleansed also. Plants at this time in six-inch pots should be transferred into those either nine or ten inches in diameter, selecting those of more vigorous growth for pots of larger size. Those in five-inch pots may go into those eight or nine inches across, observing the same rule regarding the more vigorous sorts as advised for others just mentioned. Many of the Japanese varieties succeed better in large pots, but for the incurved Anemones, and other large-flowered types, pots nine inches in diameter are excellent. For the Pompons, singles and early-flowering kinds, choose the eight-inch size, as in these they develop into quite delightful decorative plants for the conservatory. This is also a useful size to select for plants grown to give cut flowers. Crock with care, covering the crocks with a handful of half-inch bones or crushed oyster shells, this layer in turn being covered with pieces of turfy loam as before. Place a good layer of soil over the turfy loam just referred to, making it firm; and with regard to other details pot with increased firmness. The compost should be worked well down the sides of the pots, taking care not to damage the roots of the plants, and, as before, keep the surface of the ball of earth being repotted well below the rim of the pot, at least one and a-half inches, to facilitate watering. Begin first with the stronger growing and well-rooted plants, and as the operation generally takes some time, the latest batch will succeed in proper order. Stand the plants in groups of about twenty each, and thus keep them cool at the roots. If the plants are not staked by this time delay no longer. Either insert temporarily small hazel stakes about two feet in length, or secure a bundle or two of bamboo canes, which vary in length from about three feet upwards to suit the height of almost any plant. They are neat, lasting, and seem specially adapted for the purpose. Water as advised earlier.

Summer Quarters.—An open position is advisable, as full exposure to the sun and free circulation of air between the plants promote sturdy growth. The best place is one with a south and western aspect, where shelter from the south-westerly and other gales can be provided. Stand the plants in rows running north and south and upon boards, slates, or tiles to keep out worms. Stout galvanised wire should be strained between uprights at either end of the rows, and supported by others about fifteen feet apart. Two rows of wire, one at three feet and another at five feet above the garden level, will answer well, and securely tie the stakes in the pots to these cross wires, using tarred twine or thin wire. This done well rough winds will inflict no damage. Those who cannot devote a portion of their garden to this purpose should use the sides of the gravel paths.

Summer Treatment.—Chrysanthemums require unremitting attention. Watering is of the utmost importance. Water should only be given when the plants are dry at the roots, not dust dry, as this means a serious check. The way to ascertain whether water is needful or otherwise is to rap the pot with the knuckles, or anything

to answer the same purpose. When a distinct ring is the result, a full supply of water is required, but the reverse is the case when the sound is dull. When watering always give a copious supply to dry plants, and if any are very dry go over them a second time. As the plants are so much exposed to air and sun the soil dries quickly; when they are well rooted, it is necessary on hot days to look at them three or four times. As the shoots progress carefully loop them to the stakes. It is a mistake to tie lightly, as the growths are brittle and break off quite easily. A loop-like tie gives sufficient space for the shoot. Tie where the stem is hardening. Earwigs must be trapped as the plants develop, otherwise they eat out the points of the shoots, and the way to catch them is to put thumb pots with hay or paper in them upside down on the stakes. Inspect the traps each morning, and shake the contents into a vessel of boiling water. There are many other contrivances for trapping the earwigs, such as bean-stalks and match-boxes, and all are good in their way. In early May watch for a leaf-mining maggot, which quickly works into the tissues of the leaves. Unless means are taken to check the spread of this pest the plants suffer seriously. The maggot can easily be traced, and when seen removed with a penknife, or else squeeze the affected leaves between the finger and thumb. As a preventive the plants may be dusted with soot, or, what is better, syringe a solution, made from quassia chips, over the plants occasionally during early May and once or twice afterwards. Another pest, known to growers as the "jumper," often causes havoc among the tender growths just before bud formation. It is very active and difficult to catch, but by constant disturbance of its quarters and lightly passing the hands over the shoots each time the plants are visited its depredations are stopped. Green-fly and black-fly may be easily eradicated by dusting with tobacco powder, no matter when they make their appearance. Dust the under side of mildewed leaves with flowers of sulphur.

Buds and their Development.—Each plant first develops what is known generally as a "break" bud, which is the first change in the plant's life, and so called because the plant breaks out into fresh growth from this point. The bud appears in the apex of the single shoot, which is grown on from the cutting stage, and is surrounded by several new growths. It is usual to pinch out the bud, selecting afterwards to be grown on three or four, more or less, of the strongest shoots just referred to. These fresh shoots soon go ahead, and in the course of two to three months in most cases a bud is developed in the point of each of the shoots grown on from the "break." These buds are known as first "crown" buds, and growers of exhibition flowers frequently retain or secure this bud by pinching off the young shoots surrounding it, leaving the bud quite alone at the apex of the shoot. As many Chrysanthemums, however, fail to give the best flowers from a first "crown" bud selection, this kind of bud is pinched out and one or more of the young shoots surrounding it are grown on vigorously. These in about a month or six weeks each develop what is called a second "crown" bud; and as this is the

more popular kind it is more often retained. As in the case of the first "crown" buds, a bud is retained by pinching out the shoots surrounding it, leaving each bud quite alone at the top of the shoot. Second "crown" buds invariably develop handsome flowers, and are highly valued for their decorative value in the conservatory as well as for exhibition. The majority of Chrysanthemums develop first the "break" bud, then the first "crown" bud, which is succeeded by the second "crown" bud, and finally by a "terminal" bud. A terminal bud marks the termination of the plant's growth, and instead of only one bud being developed on each stem or shoot, the buds are produced in clusters. The whole of these terminal buds are seldom allowed to develop, they are more often thinned out slightly, in which case they make a charming flower display when most of the big flowers are over. When terminal buds are preferred to all others the second "crown" buds must not be retained but be pinched out, and the shoots succeeding them grown on. In a short time the terminal buds will develop and must be thinned out as described. A few Japanese varieties persistently develop "crown" buds, but ultimately even these produce their crop of terminal buds.

TERMINAL BUDS

So called because they terminate the plant's growth. If only one large bloom be desired, remove all but the largest bud in the centre. For a free display of blossoms remove a few of the more crowded buds, leaving the others to develop in the ordinary way.

Period for Buds to be Retained.—Chrysanthemums vary so much in time of flowering that it is difficult to determine buds of new kinds to secure. However, as a general rule, retain buds of Japanese varieties any time after the first week in August, deferring the selection of buds of the Incurved and Anemones until the end of the same month, and the first week of September. The Pompons, and small decorative sorts on terminal buds, if retained during the middle of September, develop their flowers the second week in November. The buds should be kept in an upright position when once they have been retained, these remarks applying more particularly to buds grown to produce flowers of high quality. The advantage of observing this somewhat simple rule is that the buds develop evenly, and the long graceful florets unfold in the correct way. Small hazel stakes should be tied on the stouter ones inserted in pots earlier in the season, and so arranged that they are brought up immediately under the bud.

Terminal Buds.—The illustration depicts the development of terminal buds. If a free display of blossoms be the aim of the cultivator the whole of the buds should be allowed to produce flowers. If three or four blooms only are wanted, disbud to this number. In all cases, where large handsome flowers are desired, every bud but the one marked A should be removed. Before this is determined, however, the bud it is proposed to retain should be carefully looked over, to see if it is of good and even shape. Should this fail to attain the standard required, retain one of the smaller buds surrounding it, removing all others at the time.

Bush Plants.—These find much favour with those who prefer an abundance of flowers. When they are propagated as early as December or January, there should be no difficulty in obtaining very large plants. The method of culture to be followed in this case is very simple. When the young plant is from six inches to eight inches high, pinch out the tip or point of the shoot, thus inducing the plant to break out into fresh, new growths at the axils of the leaves immediately below. From this time, as succeeding shoots attain a length of six inches, pinch out the points. If a November display be the aim of the cultivator, the last "pinching" should take place during the third week of June, while for a December display continue pinching the shoots until about the tenth of July. The plants by this treatment flower on terminal buds, and with the exception of thinning out if necessary they may be left to develop. For the greenhouse and conservatory these plants are unequalled, and as cut flowers for indoor decorations, these freely flowered plants are specially suitable.

Early-Flowering Chrysanthemums.—Those who have never grown the early-flowering Chrysanthemums miss many charming varieties, which may be grown with ease by the beginner. Immense strides have been made in recent years with the Japanese varieties. Although there are a number of delightful Pompon varieties, they are now largely outnumbered by Japanese kinds of recent introduction. They are essentially plants for the outdoor garden, where their flowers make patches of colour when Dahlias and other tender subjects are cut down by frost; the early-flowering Chrysanthemums continue blossoming freely until severe frosts occur. The best plants are dwarf and branching, and develop their growths without any interference whatever. Cuttings may be inserted between January and the end of March, while many of the Pompons may be propagated as late even as May. The advantage of early propagation is that larger plants by these means are developed, January cuttings often resulting in plants which will carry one hundred and fifty flowers. They should be potted up into pots of various sizes as advised for the mid-season sorts, the last shift for plants intended for the outdoor border being into those five inches in diameter. Before planting out, carefully harden off the plants in cold frames, and stand them together in batches in a sheltered position out of doors. The third week in May is the best time for planting, all danger of serious frosts then being over The ground should have been deeply dug previously, but not too much enriched with manures. Plant firmly, allowing a

distance between each plant of three feet for the Japanese sorts, and the same distance between each row. The Pompons require less space, two and a-half feet between the plants and the rows answering the purpose well. An occasional hoeing between the plants during the summer months will keep weeds in check, and sweeten the soil. In very dry weather water copiously, and give a liberal supply of liquid manure once or twice after the buds are formed. In wet weather dust the soil around the plants with one of the concentrated manures. It will be necessary before the summer has advanced much, to insert a stout stake, or bamboo cane, for the support of the taller plants. The main stem should be tied fairly tightly to the stake, and the branching growths lightly looped to it also. Do not disbud the plants except in the case of the more crowded sorts, and then only partially, or the flowers will expand quite out of character. The early-flowering varieties succeed well in pots, those eight inches in diameter, in almost every instance, answering their requirements.

Housing the Plants.—With regard to the ordinary mid-season, or November-flowering plants, they must be placed under glass towards the end of September, or the first week in October. The work entirely depends upon the condition of the plants, and the kind of weather at this period. Plants should be housed in September as soon as any of the buds begin to show colour, otherwise the heavy dews will result in "damping," in which case the buds often become worthless. About the third week in September sharp frosts often occur, and it is wise to place as many plants as possible under glass without delay, as the grower must run no risks at this time. When the weather remains genial and open, proceed with the housing of the plants leisurely, making a careful arrangement to obtain a good effect. Thoroughly cleanse the glass, lime-wash the walls, and make the roof waterproof. Drip must be prevented at all costs. On no account crowd the plants, as this is a fruitful source of failure.

Treatment of Plants under Glass.—When once the plants are housed in the autumn, and their arrangement determined so as to obtain the best effect, give abundant ventilation. To keep the plants healthy, doors and ventilators should be kept wide open when the weather is favourable. When they are not crowded, and air is permitted to circulate freely in the house, the leaves are less apt to fall. It is well to water in the early morning, so that superfluous moisture is dried up before the evening, and give liquid manure until the flowers are two-thirds expanded, after which gradually cease supplying stimulants until only clear water is applied. Dead leaves should be picked off, and the soil in the pots kept free from weeds. The trapping of earwigs should also be continued, and caterpillars watched for after dark, a good lantern being invaluable for this purpose; keep hot-water pipes well warmed on frosty nights and days. Also, when the weather is damp and foggy, maintain a temperature of about fifty degrees; this will prevent damping, and assist the buds to open.

THE COLD GREENHOUSE, AND THE FLOWERS GROWN IN IT

"K.L.D.," a clever amateur gardener, sends the following practical and interesting notes about the cold greenhouse :—

There are many phases of garden work and countless varieties of plant-houses, but amongst them all it is a matter of regret that more use is not made of the unheated greenhouse. As an early pioneer of cold-house gardening, let me tell the story of my first experiences. It takes a long look back through the vista of years to recall the old tumble-down country rectory which had to be rebuilt, and the hope and despair of having a greenhouse at all, which trembled in turns in the fateful balance of pros and cons, and how, in the end, a fairly good lean-to vinery was built of the window sashes of the old house. There, in after years, many a good bunch of black Hamburgh Grapes was cut, and many a fine plant grown, though it is the fashion nowadays to say—and with a good deal of truth—that grapes and flowers cannot be grown together. There was nothing better, by way of heating power in this vinery of about twenty-five feet in length than a slow combustion stove—far from an ideal mode of gaining a genial plant-growing atmosphere. But it was not the vinery that made me a cold-house gardener. As luck would have it, a mistake in building the new house made it needful, either to block up the side windows of both drawing-room and dining-room, which opened upon the lawn, or to build some kind of glass porch or vestibule to enclose them and keep out an unbearable draught. The result was a charming little conservatory, but one in which a boiler and pipes, owing to its position, were quite out of the question. Moreover, the village was situated on very high ground, nine miles from a railway station, and coal cost as much or more than it does now even in these days of high prices. The problem was how to keep this conservatory bright with flowers at all times of the year, and rather a stiff problem it was to solve. I was but a novice in garden work in those days, but I happened to have two qualifications which stood me in good stead, a strong love of flowers and a fairly good

knowledge of hardy perennial plants. So I made up my mind to face the difficulty and to overcome it with my own hands, for the garden was large and there was quite enough for the gardener to do. He was a clever, faithful, and handy man, and I had his good help in many a contrivance through a long series of years, but potting and watering, seed-raising, and slip-taking, and all the ordinary work of a greenhouse I learnt to do by practical experience in happy hours of leisure. Space will not allow me to tell of the failures and difficulties of the first year or two—perhaps it is as well that they be buried in oblivion—but success came at last, and folk with big conservatories were sometimes rather piqued to find in the modest little rectory greenhouse new and rare plants which were strangers to their own. A few hints, therefore, from an "old hand" may be of use to beginners.

First of all **one must not attempt too much.** Failure generally comes from trying to grow, in an unheated house, plants which require a higher temperature than can be given. One must not expect, for instance, to be able to grow Pelargoniums of any sort unless the thermometer can be kept well above freezing-point at all times. It must always be borne in mind that the mere shelter of glass, while it protects from heavy rains and wind, will not keep out hard frost, therefore hardy plants only are suitable for a cold greenhouse. Even the hardiest will look unhappy out-of-doors in a severe spell of frost or a tearing wind. Have we not all noticed the drooping, downcast look of common Rhododendrons when the ground is ice-bound and a chill wind rustles through the stiff-frozen leaves? Yet no sooner does a thaw warm the air and loosen the frost-bands than they lift up their heads as if nothing had disturbed them. It is different with the fine early-flowering sorts, whose foliage is safe enough, but whose crimson and pink blossoms are too fragile to bear the bruising hail or the blustering gale, and who piteously ask for a little shelter that they may fulfil their destiny in peace. In these, we have an example of one class of plants suitable for the unheated greenhouse; such, in fact, as are hardy enough to live through even severe winters, but whose flowering time is too early to resist injury, in most localities, from inclement weather. There are many such which, with mere shelter in a light glass-house, will come into flower, and bring us a welcome foretaste of spring while the garden, maybe, is yet lying frost-bound. Perhaps this may seem to be somewhat a dull limit to put on the possibilities of the cold greenhouse, but think of the early Azaleas, Camellias,

Mezereon, and double-flowered cherry and peach and plum —of the host of hardy bulbs—Narcissus and Tulip, Hyacinth and Lily, and rare Iris, which are so beautiful as to win for themselves a comparison with the gorgeous Orchids of the tropics. Think, too, of everyday flowers—"pale Primrose" with all her sisterhood, the lovely blue Forget-me-Not, and Lily of the Valley, so common yet so precious that florists not only force it into bloom in winter's cold, but lock it up in ice that we may rejoice in it during summer heat; are not such as these always welcome? There is no fear, believe me, that we should lag far behind our neighbour in the matter of choice and fragrant flowers even though we cannot vie with his stove exotics.

It is in the dead of winter—those few weeks that usher in and follow Christmas—that the resources of the cold-house gardener are taxed to the uttermost. Chrysanthemums—admirable plants for the unheated greenhouse if well managed—begin by that time to look uncomfortable and to damp off; and except Roman Hyacinths and the earliest of Van Thol Tulips, it is a little soon for bulbs. It is well, at this dreary season, especially if a conservatory must be kept in good order, to have a supply of evergreen shrubs and ferns, so that greenery at any rate may cheer us, even if flowers be few. Myrtle, both large-leaved and small, Laurustinus, Veronica, Eugenia, and Aralia are all well adapted for this purpose. A hardy Fan-Palm or two may be added, with small-leaved variegated Ivies and evergreen Ferns, such as the finer Hart's Tongues and Welsh and other forms of Polypody. These and such as these are a great stand-by in the way of sturdy foliage plants, and will serve many a good turn at all times of year.

During those same few dark weeks, when all nature is at rest, I am bound to say that a small, movable heat-radiator, set going by a lamp, was of great use in the conservatory, as much for the purpose of drying the air as to keep out frost. It saved the plants from that shuddering look which even the boldest will put on under stress of severe cold, but this was never used and, in fact, was not required except in case of very hard weather.

No form of cold greenhouse is more delightful, perhaps, than **a rose garden under glass**, and this requires absolutely no thought of heating even of the most temporary kind. It has, also, the advantage of being the least costly as to furniture, for a central bed and borders at the sides of a span-roofed house may take the place of stage and benches. Here Tea-scented, hybrid China, and Noisette Roses of choicest kinds, planted out, will give endless pleasure to its owner and will

rarely be without some fair blooms to reward his care; but space may also be allowed for pots of flowering bulbs to be brought in from outdoor quarters during winter and early spring or, in late autumn, groups of Chrysanthemums, when Roses are scarce. Or the unheated greenhouse may be used as **an Alpine garden.** The rarest gems of the mountain, Soldanella and Saxifrage and Gentian, even *Eritrichium nanum* itself, that sore puzzle to Alpine lovers, strangely enough, seem to find in the shelter of glass some amends for the snow covering they have lost, and may here be grown with rare success. In fact, there is a wide range—even that of the Temperate Zone—where we may wander in search of suitable plants, but we must take care that our footsteps do not trespass even on the verge of the Tropics, or we may court failure.

Two important points of structure amongst many may be just touched upon. These are **ventilation and shading.** The plants we wish to grow are children of liberty and come from the open plain, the breezy hillside, or the rocky height. Plenty of fresh air, but without cross-currents, is essential to their well doing. Therefore, take care that the cold greenhouse be amply provided with ventilators which can be opened or shut according to the way of the wind. Shading is of scarcely less importance, but in nine cases out of ten is missing altogether. It often happens that bright sunshine treads close on the steps of a hard frost. If it fall on frozen foliage under glass, the most serious mischief follows. Should it be possible to arrange an outside covering of felt on rollers protected by a ridge to be used in case of need, so much the better. It will make all snug in severe weather. But in any case, do not neglect to have inside blinds of some sort, not only to tone down the too fervid rays of the summer sun, but no less to prevent the winter scalding of frozen plants.

The merits of an unheated plant-house are manifold, for they include economy in working, freedom from anxious care and labour of heating, and a vast choice both of beautiful plants and of methods in using them; but its management, perhaps more than of most glass-houses, is a matter of study and forethought. Study, that one may know what to grow and how to grow it; forethought, to prepare early in the year the plants one wishes to find in flower before its close, but he who thinks in due season and acts upon his thoughts will not regret the time nor find it wasted, that has been spent in the genial atmosphere of an unheated greenhouse. [The list of plants for the cold greenhouse recommended by "K.L.D." is given in the chart.]

CATTLEYA LABIATA.

ORCHIDS

ORCHIDS are no longer charmed flowers — their classic beauty shines in the plant-house of the amateur gardener; but once, not many years ago, this quixotic plant was reserved only for those whose flower-loving propensities were not hampered by financial considerations. Collectors, brave men, have scoured the world in search of the air Orchids, the Epiphytes, whose lives are spent amid the tree branches of the jungle, and sent them home in cartloads from all quarters of the globe—from the mountains of Mexico, from the swamps of the Tropics and from the pleasant mountain heights; the family, through their cosmopolitan distribution, requiring, when brought under home influence, treatment of a varying kind. Of course, the tyro in things botanical or horticultural knows that in these little isles of ours many charming Orchids are happy in chalky downs or cliffs, or in the lush meadow, and of these the Bee Orchis, Spotted Orchis, and the dainty Lady Slipper (*Cypripedium Calceolus*) occur to mind as flowers worthy of a special place in the rock-garden. An Orchid flower is an interesting study, and its fertilisation one of the most fascinating experiments to the botanist, or he who strives to raise new forms by joining together two species to produce a hybrid. Though the Orchids apparently differ so greatly from each other, they are botanically of the same family, and the flowers assume many strange, grotesque, and beautiful forms—some almost deceiving the careless observer by their resemblance to some insect, others rejecting the common mode of sustenance by seeking the tree branches, to which they cling by their thick white roots, deriving from the moist atmosphere their life's support. Orchids are not parasites. A parasite is a plant that lives upon its host, but to the Epiphyte the tree is simply a support. A wonderful organ of the flower is the lip, or "labellum," to use botanical language, and this assumes many strange shapes, sometimes reminding one of a pouch, as in the Cypripedium or Lady Slipper, and sometimes it is so lightly attached to the main part of the flower that the least breath of wind causes movement, whilst in the waxy Angræcums the lip is lengthened into a spur filled with

nectary, for the long proboscis of insects to drink the sweet contents. It is also noticeable that the colour is frequently concentrated in this labellum, probably to attract the attention of insects, who are thus drawn to the flower to seek for nectar, and innocently fertilise it by removing pollen, which, when the intruder enters another flower, results in fertilisation; hence seed is obtained.

Many of the most beautiful Orchids in cultivation are the result of hybridisation by human agency. The hybridist, as he is called, sees two flowers likely to produce a distinct or beautiful offspring, and fertilises the two to effect his object. But so much has been written upon this subject by Darwin, that it is needless to make further reference to it in a simple work of this kind.

When Orchids were first exported from their native haunts to the hothouses of Europe they were destroyed in cartloads by improper treatment. This is no exaggeration. Everything that came from over the seas was regarded as exotic, and that meant a stewing temperature at complete variance to the natural conditions surrounding the plant. Of course the unfortunate Orchids died wholesale. To treat an Odontoglossum coming from the snow-line as an exotic is, of course, to exterminate it; but happily we know more of the world than we did fifty years ago, when Orchid-hunters sent over their possessions to Europe; and the following notes about the best kinds for the beginner to consider, with cultural hints, will, it is hoped, prove the means of preventing many failures. It is not pleasant to fail, especially when the death of a plant means a financial loss. Beginners with limited means are strongly advised to commence with quite the cheaper kinds, and by cheap we do not mean flowers of little beauty. Many of the most precious Orchids, the lovely *Odontoglossum crispum* as an example, are ridiculously cheap, costing little more when imported than the scarlet Geranium of a cottage window.

The House.—The house in which to grow the plants must necessarily receive first consideration. This need not signify an expensive outlay. A house in which the temperature can be maintained at from 45 degrees to 50 degrees in cold weather will be found suitable for many of the most useful, beautiful, and interesting species of the Orchid family. One of the chief considerations should be the matter of

Ventilation, but it is the usual system now in the construction of glass-houses to make ample provision so as to insure ventilation in the side walls almost opposite the hot-water pipes, and also in the roof, so that a free circulation of air can be provided. This is as necessary for cool-house

Orchids in summer as the protection against frost during the colder months of the year. With regard to the plants which require intermediate and stove-house culture, the ordinary conditions usually provided for warm greenhouse and stove plants will be found ample to meet the requirements of these sections of Orchids.

Orchids as Town Plants.—It is a most interesting fact that many of the largest and best collections of Orchids in this country, both in trade and private establishments, are in London and other large towns and smoky districts. Fogs and absence of light are drawbacks, causing loss of bloom during the winter months, otherwise there is little to complain of. In fact, the Orchids withstand the unfavourable atmospheric conditions above-mentioned far better than soft-wooded, greenhouse, and ornamental foliaged stove things generally grown by amateurs. The writer has been employed amongst Orchids in town districts for the greater part of the last twenty-five years. It must be admitted that the flowers are destroyed wholesale by fog, especially among the warm-growing sections, but the majority of the species and hybrids, which are the most suitable subjects for beginners, belong to the cool and intermediate-house, and are, therefore, not so susceptible to unfavourable atmospheric conditions.

Their Culture.—A good collection of cool and warm-house Orchids can be procured as cheaply and cultivated with equal success as a house of Ferns or other plants. When, however, the collection is large and expensive, a man of experience is indispensable. Any enthusiastic plant cultivator who can successfully cultivate other plants may prove successful with Orchids also. To make the cultural conditions of the various species plainly understood, particulars are given of each species as they are referred to.

Anguloa (*The Cradle Orchid*).—This handsome Orchid in all its varieties may be successfully grown in the cool intermediate-house. The plants require plenty of moisture at the roots during the growing season, but as soon as the growths have matured give only sufficient to prevent the pseudo-bulbs from shrivelling. The flowers are produced with the young growths in the early summer, and the best time to repot is when the new roots are coming from the base of the young growth. The potting compost required consists of two parts peat to one of sphagnum moss. Ample drainage must be afforded.

Cymbidium.—Such species as *C. Lowii*, *C. igganteum*, *C. tracyanum*, and *C. eburneum*, may be accommodated in the fernery or cool intermediate-house. The plants are useful and interesting. They bear their flower-spikes early in the spring, and remain for several weeks in

perfection. A compost of one part fibrous yellow loam and the remaining portion made up of fibrous peat, dried cow manure, sphagnum moss, and rough sand or broken crocks is required. The plants should have ample pot room, and, being strong rooting, should not be disturbed oftener than is really necessary. They must have ample drainage, require a liberal supply of moisture during the active season of growth, and must never be allowed to suffer from want of moisture at the roots. A cool, moist atmosphere suits them best during the summer months of the year.

Cypripediums (*Lady's Slippers*).—There is not a more varied and easily cultivated class of Orchids than the cool and intermediate-house Cypripediums of the eastern section. The geographical distribution of the various species is confined to a limited space within the Indian monsoon region, where they sometimes follow mountainous chains, on which the species occur in groups of twos or threes, or are isolated at great distances from each other. Others are confined to islands or groups of islands. In the former case they usually occur at considerable elevation, where the rainfall is copious and frequent and the dry seasons are of short duration. On these elevated situations they are found growing chiefly on the ledges, and in crevices of limestone rocks, and in similar positions where there is a small accumulation of decayed vegetable matter, generally in the shelter of overhanging trees.

The kinds that are confined to islands grow at a much lower elevation. These naturally require higher temperatures than the mountain species. It is therefore to the cool-growing section that the beginner's attention is directed. The majority of these lend themselves readily to artificial conditions, and with a few exceptions, the cool-growing kinds, not only retain their normal vigour, but the cultural effect is apparent by increased size, substance, and more highly-coloured markings of the foliage. The flowers also are in many cases larger, and the usual one-flowered scape occasionally becomes twin-flowered. This, no doubt, is caused by the more liberal and regular treatment that can be afforded the plants when cultivated in our glass-houses.

The intermediate-house section requires a temperature of 55 degrees. The following species and hybrids will be found suitable :—*C. barbatum*, *C. callosum*, *C. bellatulum*, *C. venustum*, *C. exul*, *C. Charlesworthi*, *C. niveum*, *C. concolor*, and the natural hybrid *C. Godefroyæ*, *C. Druryi*, *C. hirsutissimum*, *C. spicerianum*, and the hybrids that have been derived from the intercrossing of the above-mentioned species, also those derived from the influence of one of the hot or the cool-house section.

The potting material required differs according to the locality. In districts where the atmosphere is pure and free from the poisonous gases such as prevail during the winter months in the neighbourhood of large towns, the compost may be two parts fibrous peat to one of sphagnum moss. To this may be added a liberal sprinkling of fibrous loam and sufficient rough sand, or finely broken crock, to retain an open and porous condition. In town districts the use of loam must be avoided. *C. bellatulum* and its allies may be potted only in lime rubble, or the

latter mixed with fibrous peat. The plants should also have a light position close to the roof glass. The pots used should be drained to two-thirds their depth with clean broken crocks, and only be sufficiently large to contain them comfortably. After the plants have been put in position the potting compost may be pressed moderately firm about the roots, mounding slightly towards the centre, and finishing with the base of the plant just below the rim of the pot. After potting water thoroughly with soft rain water, which should be poured through a moderately coarse rose on the can. Rain water is most necessary, as when hard water is used it soon kills the moss, which quickly turns sour, and, decay thus commenced, quickly spreads into the remaining portions of the compost. Water must be carefully given until the roots get hold of the new compost, then more liberal conditions may be afforded. Damp down the floors and staging twice a day in winter when the temperature is normal. When the temperature is low, owing to unfavourable conditions outside, the atmosphere must not be too moist. During the hotter months of the year charge the house heavily with atmospheric moisture, which may be easily provided by frequent dampings. The house may also be freely ventilated when the temperature has advanced above 60 degrees. In ventilating take care to avoid direct draughts, and give careful shading in bright weather.

The cool-house Cypripediums require a temperature of about 50 degrees, and their requirements may be provided by any one in the possession of a greenhouse, where the above-mentioned temperature can be maintained in cold weather. The potting compost is the same as advised for the intermediate-house section. The cool-growing kinds are perhaps the most useful of the whole of the Cypripediums; they bloom when other flowers are scarce, *i.e.* during the winter months from the end of October to the beginning of April. Their varied characteristics, combined with good substance and lasting qualities, render them useful for market and to use as cut flowers. Plants may in most cases be procured for a modest outlay of a few shillings. One of the best is *Cypripedium insigne*, a species which was until recently regarded as almost too common to grow; but since Orchids have become more popular for cutting it has proved one of the most useful kinds for the purpose. So much is it valued that one of the largest market growers says that even in the glut of the season last winter he could easily procure threepence each for the flowers, and after the New Year they realised much higher prices. Later importations of *C. insigne* have yielded some wonderful varieties, among them many of dark colours and heavily spotted forms of large proportions, others delicately tinted with green and yellow. Several among them, though purchased for a few shillings, have proved of most priceless value, as much as 150 guineas having been paid for small plants in some instances. This illustrates the desirability of procuring imported plants. One could quote several instances in which the buyer of a single plant, for the modest outlay of less than half-a-crown, has obtained a form of great value. The importations of this species generally arrive in the early spring.

Other species such as *C. villosum* and *C. Boxallii* require a liberal supply of moisture throughout the year, but during the months from March to October an abundance of moisture also at the roots. They may in each case be kept a little drier at the roots for a few weeks after the flowers have been removed. The repotting of the cool section should be done in early spring.

Propagation.—The best way to increase the stock is by division. If three or more growths, with foliage, are formed successively on the rhizome, the two front ones may be parted by carefully cutting through the rhizome between the second and third; carefully remove these with as much root as possible, leaving the old growth untouched. These back growths generally break freely, and in a short time make good plants. The part removed may be potted up in the usual way. The best period at which to divide Cypripediums is when the new roots are being emitted from the base of the young or last-made growth. When divisions are made of plants in this condition, with due encouragement, they quickly re-establish themselves in their new quarters. Freshly potted plants, especially where divisions have been made, should be carefully shaded from the direct rays of the sun.

Dendrobium.—Some of the species of the deciduous section, such as *D. nobile* and its allied species and varieties, will thrive at the warm end of the intermediate-house; but the majority are happier in a hot-house. They are not recommended for cool treatment. *D. infundibulum* and its allied form *D. jamesianum* succeed grown with the Odontoglossums in the cool-house. *D. japonicum* may also be grown here during the summer months, but the temperature of the cool intermediate-house is more suitable. The pots should be well drained and the potting compost consist of chopped sphagnum moss and a little fibrous peat. Water freely during the growing season, very little indeed being required after the growths have reached maturity.

Disa grandiflora.—This is one of the finest of cool-house Orchids. It is a native of the Table Mountain of the Cape, and during the growing season requires a free circulation of air at all times. It should be frequently syringed whenever the outside conditions are favourable. The potting compost will also require to be kept moist, especially after the flower spikes commence to develop. They will require a continuation of liberal treatment until the flowers have been removed, after which period only sufficient moisture will be required to keep the tubers plump. Repotting should be carried out in the early spring, using ample drainage and a compost of equal portions of peat and chopped sphagnum, adding a liberal sprinkling of rough sand and pressing the compost moderately firm. They do well in a cold frame, where they must be kept shaded during the summer months and be protected from frost in winter. This is by far the finest species of the South African Orchids. Several hybrids have been obtained by using *D. grandiflora* as one of the parents. These form charming additions and generally possess better constitutions than the parent species, and are worthy of every consideration. *Watsoni* and *Kewensis* are very free both in growth and bloom.

DENDROBIUM NOBILE ALBUM

Epidendrum.—This is a very large family, comprising several kinds that may be regarded as suitable for beginners; but the only one selected from which the greatest amount of pleasure will be derived is *E. vitellinum majus*. This is one of the most charming of cool-house Orchids, producing brilliant orange-scarlet flowers on graceful racemes, which last for months in perfection. It succeeds well with the Odontoglossums, requiring similar conditions as regards potting and during the active season of growth. When the resting time arrives, that is, after the flowers have been removed, water may be almost entirely withheld, as the moisture in this division is sufficient to maintain a plump condition of the bulbs. When growth commences give liberal treatment to encourage a free growth.

Lælia.—The Mexican Lælias form a delightful group of late autumn and winter flowering Orchids. They require almost full sun, with free ventilation in summer, and a temperature of not less than 55 degrees in winter, until the flower-spikes are removed, after which, under drier and resting conditions, 50 degrees, or even less, will not be hurtful. The potting compost should consist of equal parts of fibrous and living sphagnum moss, and to this may be added a liberal sprinkling of broken crocks. Give plenty of drainage, as the plants require an abundance of root moisture during the growing season, and avoid stagnation. After repotting, thoroughly water the plants with soft rain water, keeping them slightly shaded for a few days, until the new roots take hold of the material, after which, providing there are ample facilities for free ventilation, little shading will be required. Syringe the plants overhead, once or twice in the morning, when the weather is bright, and again in the afternoon, as soon as the sun goes down. The house should be closed previously to syringing in the afternoon, as by so doing a hot, humid atmosphere is obtained. This must be done sufficiently early to allow the foliage of the plants to become dry, and the atmospheric moisture condensed before the cool night temperature sets in. The best time to repot is when the new roots make their appearance at the base of the last made growth. The best kinds for the above treatment are *L. albida*, *L. anceps*, *L. autumnalis*, *L. cinnabarina*, *L. furfuracea*, *L. harpophylla*, *L. majalis*, and *L. superbiens*.

Under the more shady conditions of the intermediate-house, the following kinds will be found most useful. Their compact habit and miniature stature render them desirable for shallow pan or basket culture, so that they may be suspended near the roof. The potting compost required should be the same as recommended for the Mexican section. They require a liberal amount of root moisture during the active season of growth, but only sufficient will be required while dormant to retain a normal condition of the pseudo-bulbs—*L. dayana*, *L. pumila*, and *L. præstans*. These three species may be purchased imported, in their proper season, for a few shillings. They form a most useful and desirable class of plants. Cattleyas and Lælias require a winter temperature of not less than 60 degrees. The yellow-flowered *Cattleya citrina* may be successfully grown suspended on blocks near the glass in the cool intermediate-house.

Masdevallia.—The majority of the Masdevallias that may be grown by beginners belong to the large-flowered section. The Masdevallias are alpines of the Andes of South America, being found on the higher slopes above the forest, some of the species occurring near the snow-line. The majority are found at an altitude of from 9000 to 12,000 feet elevation, where the atmosphere is constantly charged with moisture arising from the hot plains below. The days are temperate, but the nights exceedingly cold. This section may be easily cultivated in a cool fernery or a shady house, where an abundant supply of moisture may be obtained during the dry summer months. The normal night temperature of the house during the winter should be 50 degrees or less in cold weather, but with low temperatures the plants must be allowed to become drier at the roots, and the atmospheric moisture reduced accordingly. The plants are not injured by a cool degree of temperature for a time, when they are dry at the roots.

The day temperature should be 5 degrees higher than the night. In summer keep the house as cool as possible by free and early ventilation, heavy shading and constant damping down of the floors, staging, &c. The large-flowered Masdevallias may be purchased for a modest outlay, well within the reach of the most humble amateur. They require a potting compost of two parts sphagnum moss to one of fibrous peat. The pots used should be drained to two-thirds their depth with clean broken crocks, and after the plant has been placed in position, work the compost about it, keeping the base just below the rim of the pot, and slightly mounding the compost towards the centre. The best time to repot is September and October. After potting thoroughly water the plants with rain water poured through a moderately coarse rose on the water can. During the winter, after the plants have become re-established, little water will be required, only sufficient to keep them plump, but with the return of spring new growth begins, when they will require an abundance of moisture. Ventilation and shading must at all times be governed by the external conditions prevailing, but with ordinary observation no difficulty whatever should be experienced in successfully cultivating this section. They are a success under the same conditions as provided for Odontoglossums, if placed on the shady side of the house. The best kinds to commence with are *M. amabilis*, *M. harryana* in its varied forms, *M. ignea*, and *M. Veitchii*. There are many varieties of miniature growth that are not interesting. These are suitable for basket or pan suspended from the roof. The potting compost and treatment should be similar to that recommended above. The most interesting of these are *M. polysticta*, *M. armenaica*, *M. caudata* (*Shuttleworthii*), *M. muscosa* with its sensitive lip, *M. simula*, *M. rosea*, *M. triangularis*, and *M. wagneriana*. There are also numerous hybrids, derived from the intercrossing of these sections, that are worthy of every attention. The *M. chimæra* section and those belonging to the thick-leaved varieties allied to *M. leontoglossa* are best grown in a temperature of not less than 55 degrees in winter, and are most suitable for basket culture.

Maxillaria.—Several varieties of Maxillarias are suitable for be-

ODONTOGLOSSUM CRISPUM (ALEXANDRÆ).

ginners, especially those that thrive well in the cool-house, either grown with the Odontoglossums or with the Masdevallias. They require the same potting material, and should in all cases have ample drainage. They require an abundance of water at the roots during the growing season, and should never be allowed to suffer from want of moisture at the roots whilst dormant. The best kinds for amateurs are *M. venusta*, *M. grandiflora*, *M. luteo-alba*, and *M. sanderiana*. The last-named kind should be placed under slightly warmer conditions from October and April.

Miltonia.—With few exceptions the species and hybrids, both natural and raised at home, may be grown successfully in a house where the temperature does not fall below 50 degrees at night. The most easily cultivated is *M. vexillaria*. This Orchid produces flower-scapes, bearing several flat pansy-like flowers in various tints from white to rose. This species and its varieties are amongst the most perfect and distinct in colour of the entire race of Orchids. They require a potting compost of two parts living sphagnum moss to one of fibrous peat. The pots should be drained to two-thirds their depth with clean broken crocks and the plant placed in the centre of the pot, so that the base of the new growth is level with the rim. After spreading out the roots, work the compost carefully among them and press moderately firm, and finish off with a mounding slightly to the centre, but be brought up sufficiently high so that the new roots may be just beneath the surface. They will thus grow quickly away and establish themselves in the new material. The best time to repot *M. vexillaria* is in the spring, when the new growth is commencing to form the bulb. This is the period at which the new roots are being emitted and just before the flower-spikes are produced. After repotting water freely with soft rain water. The plants will require plenty of root moisture from now until the flowers are expanded, and when these commence to fade gradually decrease the moisture at the roots until the new growths are about three inches long. Only sufficient moisture should be given to maintain a plump condition of the pseudo-bulb until the young growths get well away from the base, after which more liberal treatment may be afforded. They should have a position within reasonable distance of the roof-glass. Although they need protection from the direct rays of the sun, an abundance of light is appreciated. The same remarks apply to nearly all the kinds except *M. Roezlii* and *M. Phalænopsis*, which need a temperature of not less than 60 degrees in winter. Those belonging to the *M. spectabilis* section require plenty of strong light to induce them to flower satisfactorily, and may be grown under the same conditions as the Mexican Lælias.

Odontoglossum.—As Orchids for amateurs none are so charming, useful, or more easily grown than the various species of Odontoglossum. If kept cool during the hot summer months they may be easily cultivated in the ordinary greenhouse; but in the neighbourhood of large towns, owing to the subdued light during several months of the year, it is almost impossible to obtain flowers of firm texture. Especially is this the case when the flower-spikes are developing during the winter to reach their full beauty in early spring. Fortunately the seasons

vary, and under favourable conditions many of these difficulties are overcome.

Considering the high prices now realised for exceptional varieties of *O. crispum* the beginner should purchase imported plants of this species. There is always more pleasure to be derived from imported plants than from those in which the variety has been determined. The purchaser of a bag of plants for half-a-crown may procure varieties of sterling merit. The writer witnessed the sale of a plant some few years back which was bought with two others in a bag at the above-mentioned price. When it flowered for the first time, less than two years afterwards, it was again submitted to auction in Steven's Rooms and realised £165. Many instances of this kind could be pointed out. It is remarkable that the finest spotted varieties of *O. crispum*, which are now so much sought after, have with few exceptions appeared among roots sold in small lots and at a low price. Some profess to know the better forms of the bulb; but in the selection of varieties amongst imported plants the purchaser of a single plant is just as likely to procure the best variety in the importation as the man who buys extensively. In the second place, the imported plants generally grow more satisfactorily than those that are removed from one collection to another after they have become established.

The Treatment of Imported Plants.—The plants, as soon as received, should be laid out on a damp bottom, such as a layer of sphagnum moss, on the stage in a cool, shady position. They may be allowed to remain until the plants begin to regain their normal condition or commence growing. As soon as they show signs of rooting, pot them. Another system is to pot up the plants as soon as received. The pots used in either case should be only sufficiently large to contain the plants, and be drained to two-thirds their depth with clean broken crocks. After the plants have been placed in position in the centre, the remaining space should be filled with the potting compost of equal portions of fibrous peat and chopped living sphagnum moss, which must be pressed moderately firm. Where it can be procured, chop up the large fern roots which are found in the peat, and use this instead of the crocks for drainage. Thoroughly water the plants with soft rain water as soon as potting is finished; they may then be placed in their allotted position on the stage. It is advisable that fresh imported plants be kept on the coolest and dampest side of the house. They must be carefully watered, and avoid excess, as this causes the young growth to damp and die off at the base. As the plants become established, they may want repotting, which is best done when the growth commences to form the new bulb. This is the rooting season, and the plants quickly get hold of the new compost and become re-established. For repotting Odontoglossums choose September. They must be carefully shaded from direct sun after repotting, and the house kept rather closer for a few weeks, with plenty of humidity in the atmosphere.

Odontoglossums require careful summer treatment. It is difficult to keep the plants cool in the hottest part of the day, but with heavy shading, frequent damping of the floors, staging, &c., and

A VARIETY OF ODONTOGLOSSUM CRISPUM (PITTIANUM).

ample ventilation, it is possible to maintain the temperature below the prevailing conditions outside. The inside temperature in summer should be retained about 60 degrees, the lower ventilators being allowed to remain open whenever 55 degrees are indicated inside. It is wise to close the roof ventilators when damping for the last time in the summer afternoon, opening again later in the evening after the moisture has had time to condense. Keep the atmosphere well charged with moisture whenever the outside conditions are warm and bright. The plants must not be allowed to shrivel through want of moisture at the roots at any season of the year. During the winter months maintain an even temperature of 50 degrees, and if the temperature falls below this, resort to artificial heat, but do not use more artificial warmth than is absolutely necessary.

The house most suitable for the culture of Odontoglossums is a span-roof facing east and west, affording ample means for ventilation both in the roof and along the side walls During the summer months, when the weather is very hot, provide a trellis to fit the doorway. This prevents birds or animals getting into the house. The blinds should be raised well above the glass, so that a free circulation of air may be procured and the glass kept cooler in hot weather. The lath roller blinds are the most suitable, as they serve two purposes, viz., as a screen from the sun in summer and as a protection on cold nights in winter. Every provision should be made for the storage of rain water. The stages should be covered with coke breeze about two inches deep, and the plants arranged on inverted pots, or another stage be placed above; but it is not desirable that the pots containing the plants should be arranged on the coke.

A lean-to house facing north generally meets the requirements of Odontoglossums, but they will require great care during the winter months.

Oncidium.—Many beautiful Oncidiums succeed under the same cultural conditions as recommended for Odontoglossums, such as *O. incurvum*, *O. ornithorhynchum*, and the lovely species which belong to the *O. macranthum* group. These are a success at the cool and most shady end of the house. The long flower-spikes should be trained as they advance around some sticks. These make a fine display when in flower, and last long in perfection. *O. concolor*, *O. crispum*, *O. Forbesii*, and the lovely *O. marshallianum*, require slightly warmer conditions in winter.

Peristeria elata (*The Dove Orchid*).—This is a lovely late summer-flowering Orchid. It needs, unfortunately, stove or hothouse conditions. Ample drainage is required, the potting compost consisting of fibrous loam, brown peat, and a little sphagnum moss. To this should be added a liberal proportion of broken crocks or charcoal, and press all moderately firm. Ample moisture, both at the roots and in the atmosphere, must be afforded during the active season of growth. When growth is complete the plants remain dormant for some months, and during this time only sufficient moisture will be required to keep the bulbs plump.

Phaius.—The *P. grandifolius* section and the hybrids that have been derived from the intercrossing of the various varieties, may be placed in the intermediate-house. They like a close, humid atmosphere while in active growth, and when the growths have matured they remain dormant for several months, during which period only sufficient water will be required to keep the plants plump. A compost of good fibrous peat, a little loam, and a liberal sprinkling of rough sand meets their requirements, and the drainage must be clean and ample.

Sophronitis grandiflora.—This is the most charming of the miniature cool-house Orchids. The deep orange-scarlet flowers are produced in the depth of winter and through the early spring, when they make a brilliant display, lasting for some weeks. This Sophronitis is suitable for growing in pans, which may be suspended near the roof glass. The potting requirements are the same as for the Mexican Lælias.

Vanda.—The bulk of the Vandas, although closely allied to intermediate-house Orchids, require a warm, close atmosphere during the growing season. There are a few exceptions, and one of the best of these is the azure-blue flowered *V. cærulea.* This species may be grown in the cool-house or in a vinery, the shade from the vines in the latter structure being sufficient protection from the sun. An ample supply of moisture during the active season of growth is required, and a dry and cool condition during the resting season. Grow the plants in baskets suspended from the roof, where with the vines they may be freely syringed. The potting compost should be renewed each year, and consist wholly of broken crocks and living sphagnum moss.

Zygopetalum.—Such species as *Z. crinitum* and *Z. Mackayi* are easily procured, and should be grown in the intermediate-house. The potting compost of loam, fibrous peat, and sphagnum should be pressed moderately firm about the roots. The plants should not be disturbed more than is absolutely necessary.

Insect Pests.—Many insect pests infest Orchids, but the pests to be most dreaded are thrips. These get into the central and most tender portions of the plants and if not detected cause much mischief and anxiety. Small as they are they soon cause a damping spot such as would be made at first through pricking with a pin. This soon changes colour and results in a brown burnt-up appearance and permanent disfigurement. These are what are termed by gardeners the yellow thrips. Black thrips are larger and are more easily destroyed. The eggs of the latter are deposited on the under sides of the leaves, and may be removed with a soft sponge. The best preventive is to fumigate with XL-All Vaporiser about once a fortnight, and to spray with the liquid prepared for the purpose by the same firm of manufacturers; but only spray in warm, bright weather, and when the outside conditions are favourable. Scale is destroyed by carefully cleaning with a brush and sponging with weak soft soap water. Cockroaches are most destructive to the young roots and tender flowers. These may be trapped by placing jars of treacle and water about the stages, or phosphorus paste "chases." Woodlice are also destructive to the young roots, and may be captured by

hollowing out potatoes and placing them on the stages and on the potting compost. Slugs and small shell snails are imported with the moss in the potting compost. Bran or brewers' grain is the most serviceable trap for these pests. Place them about on the stages or pots, a small pinch being put on pieces of glass or broken crocks. The pests will be found feeding in the evening and early morning, and may then be caught and destroyed. Slugs are a sore trial in the cool Orchid house, and will require to be carefully watched as they inflict damage when the flower-scapes make their appearance.

HARDY ORCHIDS

Many of the most beautiful members of the Orchid family are quite hardy. A group of much interest is that known as the Cypripediums. *C. Calceolus* is a rare native species, and very charming in colouring. The kinds to choose from are *C. spectabile*, the most handsome of all; *C. pubescens*, *C. Calceolus*, *C. parviflora*, *C. occidentale*, and *C. acaule*. *C. macranthum* is difficult to manage. *C. spectabile* makes a dainty group, its flowers white, rose-tinted, especially upon the labellum, or pouch, and the leafy stems grow to a height of two feet. Hardy Orchids appreciate shade, moisture, and a cool place. The best soil is one composed of rough peat, leaf-mould, and equal parts of silver sand and charcoal, whilst a little sphagnum moss is helpful in imparting moisture to the preparation. A cool spot, where Trilliums and moisture-loving things are happy, is suitable for the Orchids.

The Orchises form another group of much importance, and they need similar soil to that recommended for the Cypripediums. *O. foliosa* is very handsome, with its strong spikes of rosy-purple flowers. A deep but not heavy soil is requisite for this, and it may be grown also with great success in pots. *O. latifolia* is the native Marsh Orchis, and *O. maculata* is also a familiar flower in many countries (*superba* is a very handsome variety), conspicuous for its spotted and blotched leaves. Then there are the quaint Bee Orchis (*Ophrys apifera*), the Habenarias and the Fly Orchis (*Ophrys muscifera*), which all enjoy moist soil. Many plants are found in full sun on chalky downs, but it is surprising how much stronger is their growth under less starved conditions. Orchis hunting should be discouraged. There is little harm in removing a few plants from some meadow where they abound, but not some rare species probably almost extinct. The time to transplant hardy Orchids is in the early autumn, not when they are in flower. When an especially fine form is discovered mark the spot, so that one knows what plant to lift.

GOOD TREES AND SHRUBS

MANY of the most beautiful trees and shrubs for the garden are either unknown or their importance unrecognised. Only kinds of great beauty and usefulness are mentioned in the following alphabetical enumeration, and these are adapted for small gardens as well as those of moderate dimensions.

Perhaps no beautiful shrub is more neglected than *Exochorda grandiflora*, the Pearl Bush. Its near relatives (the Spiræas) are in every shrubbery, but one may go through twenty and not see Exochorda. Even of the Spiræas one does not half often enough see *S. Thunbergi*, a perfect milky-way of little starry bloom in April, and a most shapely little bush, or the double-flowered *S. prunifolia*, with its long wreaths of flower-like double Thorn or minute white Roses and autumn bravery of scarlet foliage. The hardy Magnolias are not given the opportunity they deserve of making our gardens lovely in earliest summer. Who that has seen *Magnolia stellata* in its April dress of profuse white bloom and its summer and autumn dignity of handsome though not large foliage, would endure to be without it, or who would not desire to have the fragrant chalices of *M. soulangeana* with their outside staining of purple, and *M. conspicua* of purest white, in the early months of March and April? And why does not every garden hold one, at least, of the sweet *Chimonanthus*, offering, as it does in February, an abundance of its little blooms of a fragrance so rich and powerful that it can scarcely be matched throughout the year.

Cassinea fulvida, still known in nurseries by its older name of *Diplopappus*, in winter wears its fullest dress of tiny gold-backed leafage in long, graceful sprays, that are borne in such profusion that they only beg to be cut to accompany the rare flowers of winter that we bring indoors to sweeten and enliven our rooms.

Of small-flowering trees none is lovelier than the Snowy Mespilus (*Amelanchier*), and for a tree of somewhat larger size the good garden form of the native Bird Cherry is beautiful in the early year. The North American Halesia (the Snowdrop tree) should be in every garden either as a bush or tree,

THE LOMBARDY POPLAR.

every branch hung in May with its full array of pendent bloom of the size and general shape of Snowdrops, only of a warm and almost creamy instead of a cold snow-white colour.

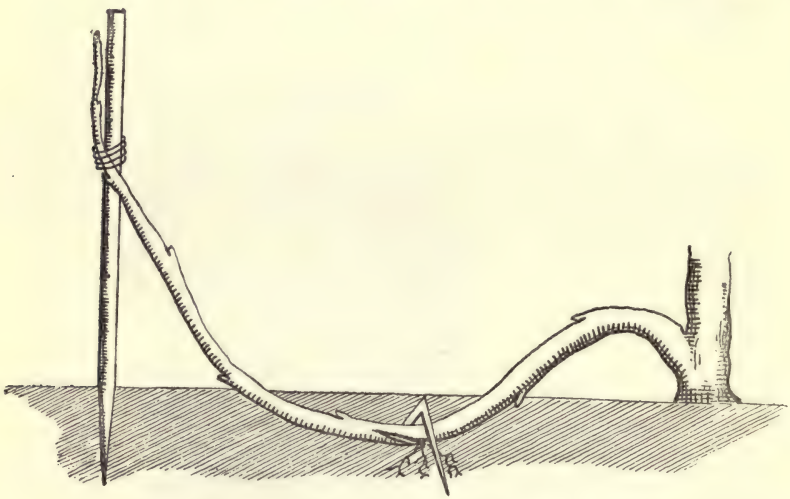
Few spring-flowering shrubs are more free and graceful than *Forsythia suspensa*, and if it can be planted on a slight eminence and encouraged to throw down its many-feet-long graceful sprays it then exhibits its best garden use. The Japanese *Viburnum plicatum* is another shrub well known but unfairly neglected, flowering with the earliest Irises. Grouped with the grand *Iris pallida dalmatica* it is a thing never to be forgotten.

Æsculus, or *Pavia macrostachya*, blooming in July when flowering shrubs are rare, is easily grown and strikingly handsome, and yet how rarely seen. *Calycanthus floridus*, with its spice-scented blooms of low-toned crimson, also a late summer flower, is a fine thing in a cool, well-sheltered corner, where the sun cannot burn the flowers. The Rose Acacia (*Robinia hispida*), trained on a wall or house, is as beautiful as any Wistaria, and the quality of the low-toned rosy bloom of a much rarer colour. It is quite hardy, but so brittle that it needs close and careful wall training or other support. To name a few others in the same kind of category, but rather less hardy, the Sweet Bay is the noblest of evergreen bushes or small trees; the Tamarisk, with its grey plumes of foliage and autumn flower-plumes of tenderest pink, is a delightful plant in our southern counties, doing especially well near the sea. *Clethra alnifolia*, against a wall or in the open, is a mass of flower in late summer, and the best of the *Hibiscus syriacus*, or *Althæa frutex*, the shrubbery representatives of Mallows and Hollyhocks, are beautiful autumn flowers. A bushy plant of half-woody character that may well be classed among shrubs, and that was beloved of our grandmothers, is *Leycesteria formosa*, a delightful thing in the later autumn. The large-fruited *Euonymus* (Spindle tree) is another good thing too little grown.

For a peaty garden there are many delightful plants in the neglected though easy-to-be-had list. One of these is the beautiful and highly fragrant *Azalea occidentalis*, all the better that the flowers and leaves come together and that it is later than the Ghent Azaleas. Then there are the two sweet-scented North American Bog Myrtles, *Myrica cerifera* and *Comptonia asplenifolia*, the charming little *Ledum buxifolium*, of neatest bushy form, and the larger *L. palustre*, whose bruised leaves are of delightful aromatic fragrance; *Vaccinium pennsylvanicum*, pretty in leaf and flower and blazing scarlet in autumn, and *Gaultheria Shallon*, a most important sub-shrub,

revelling in moist peat or any cool sandy soil. These examples by no means exhaust the list of desirable shrubs that may be found for slight sections as our remarks that follow show.

Propagation.—The propagation of hardy trees and shrubs is work of great interest, yet it is not only much neglected but imperfectly understood by amateurs. It is essential to raise young plants constantly to replace those which become unsightly, die out from old age, get too big for certain positions, or must be removed for some purpose. A knowledge of the different methods of propagation is of great



DOTTED LINES=SOIL. WAY TO LAYER TREE OR SHRUB

value. Keen observation and great patience are necessary in one who aspires to become a successful propagator.

There are various ways by which the object referred to can be attained, and the enthusiastic amateur should be master at least of some of them. When he finds that it is desirable to increase the stock of some choice kind, the importance of knowing the proper season and the best means of doing so cannot be over-estimated. It is also pleasant to raise one's own plants.

The principal methods of increasing trees and shrubs are—(1) seeds, (2) cuttings, (3) budding, (4) grafting, (5) layering, and (6) root cuttings.

1. By Seeds.—This, of course, is the most natural means of

reproduction. All seed cannot always be relied upon to reproduce its kind, in which case recourse is generally had to one or other of the methods referred to. Artificial heat in the raising of seedlings is in many cases necessary, particularly in the case of plants with rather tender constitution, and therefore the question of a propagating house, heating apparatus, soil, drainage, and so forth must be considered.

In nurseries where trees and shrubs are made a specialty of, houses devoted entirely to the production of plants are common enough, and the one that finds most favour is a low, span-roofed house, placed beyond the influence of cold winds. A walk down the centre, with cases and movable lights along one side, answers admirably, the other side being left free for plants. Hot-water arrangements should be ample, and the ventilation so arranged that little damage will ensue even in bad weather. The door should face south or south-west, as cold currents of air rushing into the house are injurious to tender growth. It will be found convenient to divide the frame into two, three, four, or more partitions, as the heat can be kept more uniform and easily confined than would be the case were fewer or no partitions introduced. Hot-water pipes should rest in a tank of water beneath the bed, and the tank should never be allowed to get dry.

It is important that seeds should not be harvested too early, but allowed to hang upon the trees and bushes until they are quite mature. Badly ripened seeds cannot be expected to produce good results. All seeds should be thoroughly cleaned before sowing, some being surrounded by fleshy matter, and others encased in shells varying in thickness and hardness according to the kind. Some seeds, like that of single-flowered Roses, should be sown immediately they are ripe. Broadly speaking, the best time to sow the bulk of tree and shrub seeds under glass is towards the end of February and beginning of March, as the seed will, in the majority of cases, germinate quickly, and with proper care good plants will result before winter. Clean pans, boxes, or shallow pots are best adapted for sowing seeds in, and the soil used should be light, sweet, and moist, but not wet. Drainage is of the utmost importance, because if this becomes clogged and the water cannot pass away freely, the soil gets sour, and consequently the seeds fail to vegetate. Over the drainage place a layer of coarse turf, covering this with rough soil, and filling up with finer compost, which should have been under cover a day or so before sowing. Sow the seed thinly, and just cover it with soil that has been passed through a very fine mesh sieve. This remark applies to all very minute seeds

falling under the tree and shrub portion of this work. Larger seeds, of course, do not require such particular attention. After sowing, the pans should be immediately placed in position in the house or frame, where they are to remain until the seedlings push their way through the soil, the latter always being watered with a very fine rose water-pot. Water given to seed pans should be "lukewarm." It is a capital plan to place tiffany or similar thin material over the seed pans, as this breaks fierce light upon the surface soil, and also prevents excessive evaporation.

When the seedlings are large enough to handle, prick them off into suitable soil, and later on remove to a cold frame, so as to harden off ready for planting out in nursery rows. If transferred to the open ground while growth is being made, much benefit will result from occasional overhead waterings until the roots are able to take up nourishment from the fresh soil. When a spell of hot, dry weather follows planting, feathery boughs placed over the plants to protect them from the sun will be of great assistance until they are established.

Seeds Sown out of Doors.—In the first place, the position the seed-beds are to occupy must be considered. These should be thoroughly well drained, and raise them just above the level of the surrounding ground. The soil should be in good workable order, as probably some seeds will remain in the ground eighteen months or two years before germination. The surface soil should be fine and quite level, and if drought follows the sowing, frequent waterings through a fine nozzled hose or rose water-pot will be beneficial.

Seeds are usually sown broadcast in beds, four feet wide, with alleys about sixteen inches wide between them, and occasionally in rows or drills, the distance between the rows varying from eight inches to a foot. Then certain kinds of trees —Carya, Hickory, Walnut, and others of similar character, possessing long tap roots and few fibres, are generally better for being sown in positions where the trees are intended to remain permanently. Birds and vermin are often responsible for considerable damage to seeds; the first-named can be kept off by nets, and traps settle the latter. Seed-beds should always be kept free from weeds, which, if allowed to grow unchecked and perfect their seeds, become troublesome and rob the ground of nourishment required for the seedling trees and shrubs.

Conifer Seeds.—Conifers, the cones of which are in some instances very hard, need special attention before the seed can be separated from them. The cones of some species are ready to gather in about twelve months, but others should

not be taken off the trees for two years, and those of the Cedar of Lebanon may be allowed to remain for three years, or even longer. Cones should be kept in a warm, dry place. With sun and artificial heat the scales open more readily, and opening is also facilitated by soaking them in water for a day or so, and by burying them in sand, &c., in February or March for six weeks or two months, by which time the seeds may be liberated and taken out with comparative ease. If the last-named method be adopted, sow the seed immediately it is set free, or it will soon lose its germinating power. The seed in the cones remains good for several years, provided the scales are not opened, and when sown out of doors, March and April are the best months for the purpose.

Conifer seeds vary much in size, and it is curious that some of the loftiest members of the family produce the smallest seed. For instance, that of the Mammoth Tree of California, *Sequoia gigantea*, is smaller than the seed produced by many shrubs less than four feet high. Larch seed should only be collected from trees that are thoroughly healthy and vigorous, as seedlings raised from seed taken from weakly trees are liable to the disastrous Larch disease.

As a rule, seedling Conifers are rather slow in growth for the first two or three years, but with proper attention, reasonable progress is made afterwards. When the seedlings are of sufficient size, lift them out of the seed-beds, and plant in suitable soil in nursery rows, protecting them from the sun with small spruce branches, until they have established themselves in their fresh quarters.

Some Conifers make better specimens raised from seeds than raised from cuttings or by grafting. To illustrate what we mean, it is only necessary to mention *Cunninghamia sinensis* as a typical example that should not be raised by either of the last-named methods, for the reason that the plants generally become flat-headed, whereas seedlings always possess a leader. It is, however, well-known to practical men, but not to the ordinary amateur, that the leading shoots of some plants, particularly those raised from lateral growths, must be cut back before a really good leader can be secured. The tops are sometimes bent over and tied down with the same object in view, and after a time fresh growth will appear at the desired place. When the original leader is a few inches in length, it should be removed and the new one allowed to take its place.

With seeds of certain kinds of trees, the following treatment, on account of the length of time they lie dormant in

the ground, is worthy of consideration. Such examples as Thorns, Hollies, and Mountain Ash are included in this category. By the method described below, much ground is saved, and labour which would be required to keep the beds in good order avoided. When the seeds are gathered, place them in heaps and mix with sand of about their own bulk, each kind being kept separate, and turned over with a spade once a month, or at least once in every six weeks, to prevent excessive evaporation. When the proper time for sowing has arrived, separate the sand from the seeds by means of a sieve, and sow in the usual way. Seeds like the *Gleditschia* (Three-thorned Acacia) which are enclosed in very hard shells, should be soaked in water for a day or so before sowing. Seeds germinate at infrequent intervals. Carefully take the biggest seedlings out of the bed with a small three-pronged hand-fork or trowel without damage to the remaining plantlets. Plant out in rows ten inches from each other, and four inches from plant to plant in the rows.

Cuttings.—The raising of plants from cuttings is undoubtedly the most popular of artificial methods of propagation. There are three essentials to success, viz., heat, light, and moisture. With such a wide range of subjects as we are now dealing with it is difficult to individualise, and we must rest content with general remarks. We shall, therefore, consider cuttings taken at two seasons, *i.e.* first in early summer, when the wood is young and half ripe, and secondly in autumn, when it is quite mature. The first-named period is the best, provided circumstances permit. The undermentioned list will give some idea of the class of subjects falling under this group: —Escallonias, Spiræas, Itea virginica, Genistas, Hypericums, Skimmias, Cistus, Veronicas, Loniceras, Deutzias, Berberidopsis, Philadelphus, Cornus, Forsythias, Caryopteris, Diervillas, Hydrangeas, Vincas, Helianthemums. Broadly speaking the best time to take cuttings of those just mentioned and similar ones is when the wood is getting firm, which will, in most cases, be from early summer to midsummer. Sturdy, short-jointed pieces should be selected, ranging in length from four inches to six inches, and if they can be procured with a heel of the old wood attached so much the better, as this greatly assists root formation, but if this cannot be managed make a clean cut just below an ordinary joint. It is necessary to be particular in every case, as some emit roots more readily than others, but it is as well to take proper care because valuable and scarce kinds may be treated in a haphazard way and many failures recorded. When the cuttings are severed from the bushes prepare and plant them

at once. If they are exposed to sun heat or allowed to get dry flagging will result, and the chances of success greatly reduced. It may be noted here in passing that plants from which cuttings are taken should be healthy and vigorous.

Whether the cuttings are dibbled in pans, boxes, or pots makes little difference, but whatever receptacle be used it should be clean, dry, and well drained. Never place the cuttings sufficiently close to cause damping, as the growth then becomes very weak, and before bushy plants can be furnished it is often necessary to cut them down nearly to the base. After the cuttings have been properly inserted in the soil, and the pots plunged in a warm close case up to the rim in cocoanut fibre or similar heat retaining material, they should be watered overhead and shaded from the sun for a fortnight or so until rooted. When the roots pierce the soil and touch the sides of the pots take them out of the case and place upon the side stages of the house, preparatory to potting off and transferring to a cold frame.

Too much stress can hardly be laid upon the value of making cuttings quite firm at the base. This is a point of greater importance than is generally supposed, and with certain sorts of trees and shrubs success or failure largely depends upon this simple fact.

To dry up superfluous moisture and sweeten the air of the case open the lights for half-an-hour or so every morning, and at the same time remove the moisture that may have collected upon the glass during the night with a cloth, sponge, or wash-leather. When the atmosphere in the frame is kept in a high state of saturation there is danger of the cuttings damping off. Another plan is to allow the bottom of the light to rest upon a small piece of wood an inch or so in circumference for ventilation and the escape of excessive moisture. Cuttings, like growing plants, prefer certain kinds of soil, and, broadly speaking, all belonging to Ericaceæ (Heaths) and Vacciniaceæ do best in a peaty soil, and it is well to remember this at the proper time. A compost suitable for the majority of tree and shrub cuttings is composed of light soil with sufficient sharp silver sand to keep it porous.

Those who do not possess a propagating house may root their cuttings under hand-lights in a made-up soil on a shady border, and if protection from the sun be afforded roots will appear in a few weeks' time. Another satisfactory way of dealing with cuttings without bottom heat is to make up a bed of light soil in a sheltered part of the garden and cover with a low light frame. The made-up soil should be about six inches deep, moist, and sufficient silver sand incorporated

with it to carry off superfluous water. The bed should be made quite firm and level and surfaced with silver sand. Dibble the cuttings in straight rows down the frame, water lightly overhead about every second or third day, and shield from the sun. The latter arrangement is specially recommended for such Conifers as Cupressus, Thujas, Retinosporas, and Biotas, but these should not be put in until about the first week in September, as the wood is rather too soft before that time. Under such treatment the writer has succeeded in striking about ninety-five per cent. of cuttings of the Conifers named above and those of similar character. Whenever terminal shoots for cuttings can be procured they should be used, as they make the most shapely plants. Such trees as *Araucaria excelsa* and *Cunninghamia sinensis* are not satisfactory generally unless the cuttings are taken from the principal growths.

Hollies, *Olearia Haastii*, Veronicas, and Skimmias root readily in cold frames. There are, however, certain sorts of trees and shrubs which are by no means easy to increase by cuttings at any time, and it may perhaps be just as well to mention as illustration the *Chimonanthus fragrans* (Winter Sweet). Plants of the Chimonanthus have been raised from cuttings, and the writer once succeeded in raising a plant, but although it threw out roots it made very little growth and eventually died. It was treated thus: A small twig was taken off during the summer with a bit of the old wood adhering to it, inserted in a small pot in moist soil, plunged in a close (not hot) case, and sprinkled overhead occasionally with lukewarm water.

Dibbles. — Box and Yew make admirable dibbles for inserting the cuttings in the soil, as the wood is very durable and does not require constant paring like that of a softer nature. The knife used for cutting should always be sharp, as cuttings made with a knife having a good edge, throw out roots more freely, and in less time than those made with a blunt one.

Rooting Cuttings in the Open Border.—This is a form of propagation adopted in autumn with certain sorts of vigorous growing shrubs and trees, of which the following serve as examples :—Laurels, Roses, Willows, Tamarisk, Privet, Philadelphuses, Flowering Currants, and Cornus. The cuttings may vary in length from ten inches to eighteen inches according to the vigour of individual kinds. They should be planted in rows a foot or so apart, allowing two or more inches between each cutting in the rows. The bed or border should be carefully prepared, the cuttings planted in a perpendicular (not

KILMARNOCK WILLOW AND OTHER TREES BY WATER.

slanting) fashion and trodden quite firmly at the bottom. During dry weather occasional waterings will assist new growth. Keep the beds free from weeds and the surface soil loose.

Budding and Grafting are subjects that hardly come within the scope of a beginner's book, and many flowering trees and shrubs are propagated in this way when there is no occasion to do so. Whenever possible trees and shrubs should be increased by seeds, cuttings, or layers, a very good method, performed in a similar way to layering, advised for the Carnation.

SELECTION AND DESCRIPTION OF THE BEST TREES AND SHRUBS

Abelias.—There are really only two Abelias sufficiently hardy for the London district, in fact, *A. chinensis*, better known perhaps as *A. rupestris* is the only one, because *A. floribunda* suffers unless some protection is afforded during severe winters. *A. chinensis* (*A. rupestris*) deserves careful consideration, for in the months of August and September, when it is laden with its small delicate pink, delightfully fragrant flowers which hang from the tips of the current season's growth, it is remarkably pretty. The flowers are serviceable, too, for placing in vases for table decoration, as they may be cut with their own foliage, which is small, glossy green, and forms an admirable setting for the flower colouring. Look over the plants yearly, and remove worn-out growths, and thus make room for young wood which should always be encouraged. The soil Abelias delight in is one composed of peat and loam, with the addition of a good quantity of sweet leaf-mould. Good drainage is essential. No matter how rich the soil may be at planting time, the plants are never happy unless ample drainage is provided to carry off superfluous water. If the ground is not naturally drained, take out soil at planting time to a sufficient depth, and throw in a few broken bricks, crocks, &c., at the bottom, covering these with rough turfy loam, over which put the made-up soil. Give water to settle the soil about the roots.

Acers (*Maples*).—These form an important group of hardy trees and shrubs. They come from North America, Japan, and Northern Asia principally, and vary considerably in size from trees twelve feet in height to those one hundred feet or more. The Maples vary considerably in leaf formation, and in the manner of growth, some being bushy, round-headed trees, and others erect, spreading, and even weeping. The following is a selection of the finest for small and medium sized gardens. No more delightful group of hardy foliage shrubs exists than the varieties of *Acer palmatum*, popularly called Japanese Maples, and it is strange that they have not been used more freely in gardens and parks. They are regarded by some as short-lived and tender, but this is quite a

mistake. With a judicious selection of varieties, and care in placing them, little fear of death from cold need be entertained. They should never be planted in water-logged soil, or where they are likely to feel the effects of east winds, both of which are injurious. Neither should they be planted anyhow in the ordinary shrubbery border, where more vigorous things would grow over them. Light and air are necessary to develop the true leaf-colour. Glorious effects can be obtained by planting on mounds sloping to the south or west, and although the Japanese Maples give the best results when planted in rich soil, that of poorer quality will suffice, provided the points referred to above have not been overlooked. As single specimens on the fringe of the lawn, and for growing in pots or tubs for indoor decoration, their value cannot be over-estimated. The great variety in form, size, and leaf-colour is almost bewildering, and the following list represents only the cream of the family. *A. palmatum aureum* is a sturdy grower, with large yellowish leaves which in autumn change to shades of orange, scarlet, and gold. *A. p. sanguineum* creates a brilliant picture in the setting sun. In growth it is bushy and free, and its leaves are deep crimson. The soft green deeply-cut leaves of *A. p. linearilobum* are very pretty, and those of *A. p. roseo-marginatum* are bright green, irregularly margined with rich rose and pink. It is a dainty variety of slender growth. *A. p. septemlobum* is a beautiful Maple with cut leaves, and *A. p. s. elegans* is another handsome form. In spring its leaves are delicate green, gradually passing through shades of pink and rose to crimson. *A. p. s. atropurpureum*, with its crimson-purple leaves, is highly ornamental, while those of the variety named *laciniata* are deep green, flushed with rose and pink. *A. p. s. marmoratum* and *A. p. s. tricolor* are also good. The *dissectum* group possesses fern-like leaves, the colours of which are exceedingly rich and enduring. Those of the type are bright green, *ornatum* bronze-purple, and *roseo-marginatum* purple-bronze, stained with rose and white.

The Silver Maple (*A. dasycarpum*) from North America makes a beautiful avenue tree, as it is of good growth, the leaves large, palmate, silvery white on the under sides, and set on long footstalks. When disturbed by the breeze they seem silvered all over. *A. grandidendatum* is useful for its effectiveness; it is of free growth. *A. macrophyllum*, also from North America, is one of the best Maples for planting on gravelly soils as it makes excellent growth. Its bold leaves are bright green, and the flowers and showy fruit are produced abundantly. *A. circinatum* is another dry soil loving species. It is neat in habit, and forms a medium-sized round-headed tree, and in autumn its bright scarlet leaves are remarkably handsome. For this reason alone it deserves consideration. The Sugar Maple (*A. Saccharinum*) is of upright growth, vigorous and handsome. Its leaves are large, bright green, and covered with a thick glaucous hue on the under sides. The autumn tints are very fine. *A. rubrum* is a well-known showy-leaved Acer, particularly in autumn, when its foliage is heavily shaded with orange and scarlet. It is of elegant habit, and often reaches a height of twenty-five feet or more when planted in a position favourable to good growth. It makes considerable

headway in dry, hungry soil, and in spring, when displaying its clusters of deep red flowers, it is one of the most striking of American Maples. *A. pennsylvanicum* (the Snake-barked Maple), also known in gardens as *A. striatum*, flourishes in dry soil and is quite distinct, as its bark is freely striped with white. It is not often more than twenty-five feet in height, and its heart-shaped leaves are very beautiful. For general effect *A. pictum rubrum*, sometimes labelled *A. colchicum rubrum*, should be remembered. It is of free growth, and its bright green leaves change to shades of purple and crimson in autumn—a tree to plant for its autumn colouring.

All the varieties of *A. pseudo-platanus* (Common Sycamore) are worthy of mention, but only a few can be mentioned. The variety named *Leopoldi* is fairly well known, and its silver variegated leaves and red petioles are showy. Although of vigorous growth it can be kept within bounds by a free use of the knife, the growth resulting from such treatment being strong and the leaves highly coloured. Another variety (*atropurpureum*) is suitable for pleasure grounds. Its branches are stout, and the leaves dark purple. The variety named *elegantissimum variegatum* is a choice tree of vigorous growth. The large cream-coloured leaves are suffused with delicate pink and rose. *A. Negundo* is a first-rate tree, but its silver-leaved form is showier and quite as hardy and free in growth. It is an excellent tree for small gardens, and unlike many variegated trees does not burn in hot suns, and succeeds famously in dry soil, but it must not be used recklessly. Its colouring is very decided, and when the tree is planted very freely the effect is "spotty." *A. N. californica aurea* makes an excellent companion to it, being perfectly hardy, vigorous, and the bright golden leaves remain true to colour throughout the summer. *A. N. elegans* is another showy variety, but unfortunately planted sparingly. It is perhaps of rather freer growth than the one just referred to. The strong growths are of a conspicuous glaucous hue, and the leaves tender green, margined and striped with yellow and cream white. *A. platanoides Schwedleri* is a splendid tree, and perhaps the most beautiful of Norway Maples. It is tall, vigorous, free in growth, and has delightful foliage, its bronzy-red deepening with age. *A. p. rubrum* is of much merit with reddish tinted leaves. It is of excellent growth, and, like the last named, very beautiful in autumn. *A. argutum*, from Japan, forms a neat specimen, and is suitable for the outskirts of the lawn. It is rather slow in growth, and has tinted, deeply-lobed leaves, which change to bright colouring in autumn. *A. japonicum* is a much branched tree of small stature, and well adapted for small gardens. Its colours in autumn are remarkably brilliant, and as the leaves hang upon the trees long after those of many species have fallen, its value for effect is increased.

The **Actinidias** are hardy climbers, well suited for training over arbours, bridges, pergolas, and similar. *A. Kolomikta*, from Eastern Asia, is perhaps the most familiar kind, and certainly the most ornamental. It is vigorous in growth, and soon covers a large space. Although its white flowers are not showy they are produced freely, and

the young leaves are of a pleasing shade of green, eventually changing to rich orange and yellow. *A. polygama* also bears white flowers and a profusion of berries in autumn. Ordinary soil suits these rampant climbers.

Æsculus Hippocastanum (*Horse Chestnut*) is the noblest of all hardy-flowering, vigorous trees for the pleasure-ground. Its beauty at flowering time is proverbial. It has been planted extensively in some parts of the country. Its native country is supposed to be Asia, from whence it was brought to this country so long ago as 1629. Although it succeeds in most soils, it seems to delight in a rich, light loam. There are varieties with double flowers, others with beautifully cut leaves, and some have golden variegated foliage, all of which are ornamental. *Æ. indica*, well known as the Indian Horse Chestnut, is a free-growing tree, with numerous branches and great quantities of white flowers marked with red and yellow. The one named *rubicunda* or *carnea*, as it is now recognised, deserves greater popularity. It grows upwards of twenty feet in height, and comes from North America. Its showy scarlet flowers, borne on substantial spikes, remain in beauty for several weeks. *Brioti* is a variety of the last named, and certainly quite as free in blossom; the large rose-coloured flowers carried on long erect spikes are quite distinct and lasting. It is a grand tree. *Æ. californica* (*Pavia californica*) is a spreading tree a dozen feet or so in height, and in August rose-pink flowers appear in profusion. It is very uncommon, perfectly hardy, attractive, and valuable for its lateness. *Æ. parviflora* (*Pavia macrostachya*), indigenous to North America, is a superb kind, and exceptionally free-flowering. Its sweet-scented white flowers, borne on long racemes with conspicuous stamens and red-tipped anthers, give additional beauty to the tree. *Æ. flava* (Sweet Buckeye), also known under the names of *Pavia bicolor* and *P. flava*, bears pale yellow flowers. It grows upwards of twenty feet in height.

Ailantus glandulosa (*Tree of Heaven*) is one of the most desirable of vigorous trees, but requires plenty of light, space, and air to bring out its real value. It produces a straight trunk, from which are given off numerous long branches clothed with much divided leaves, four and sometimes five feet long. By no means particular as to soil it makes the best growth in deep, well-drained loam, and in autumn, when bearing its great clusters of brown-winged fruits, it is one of the most conspicuous of trees. It is valuable, too, for the sub-tropical garden under certain treatment, and for this purpose it should be grown on the single-stem system and cut hard back every year. The growths that follow this treatment are vigorous, and the leaves larger than those of uncut trees.

Akebia quinata is an uncommon Chinese evergreen climber of free growth, with glossy green leaves divided into several leaflets. In April and May it produces small, dull purple flowers in short axillary racemes, and although not individually conspicuous they are very fragrant, especially at night. A deep, moist, well-drained soil is necessary, and a position where it is not exposed to biting winds, as

THE AMELANCHIER (SNOWY MESPILUS) WITH UNDERPLANTING OF STAR DAFFODILS.

these check young shoots, and sometimes, especially when accompanied by late spring frosts, kill the tender growths outright. It is a beautiful plant for clambering amongst the branches of old trees and hiding trellis work. Where the climate is cold grow the Akebia in a cold-house, as it is well adapted for clothing pillars, rafters, &c., and its purple, flagrant flowers, borne in drooping spikes, remain long in beauty.

Amelanchiers.—This is a small group of thoroughly hardy shrubs and trees of small stature. No garden of any pretensions can be considered complete without one or more trees of the Snowy Mespilus. It is very beautiful in spring when thousands of small white flowers open to the sunshine. A healthy tree in April and May is a cloud of wavy white petals. The value of Amelanchiers in the landscape is not confined to spring alone, because the gorgeous colouring of the decaying leaves in autumn is quite as welcome as the flower cloud of the early year. Amelanchiers are not fastidious. There is hardly a soil in which they refuse to grow, but a deep, rich, moist loam seems to answer best, and if shelter from cold winds can be given so much the better, because the flowers sometimes suffer in rough weather. *A. vulgaris* (Common Amelanchier), indigenous to Southern Europe, is one of the brightest of early spring-flowering trees. It is free in all ways. *A. canadensis* (Snowy Mespilus), also known as *A. botryapium*, is an old favourite, having been introduced from Canada upwards of 150 years ago. It is rather slow in growth, but reaches in the course of years a height of between thirty feet and forty feet. It forms a round-headed tree with long and somewhat pendulous branches, and when young its smooth leaves are tender green, changing to a deeper shade, and in autumn assume exquisite shades of yellow and orange. The snow-white flowers are in graceful racemes and succeeded by crimson fruit, from which plants can be readily raised, but when layered the trees flower a season or so before those raised from seed, indeed before they are two feet high. Little trees of this kind are welcome in the conservatory as well as for massing on the grass. The variety *obovalis* (syn. *oblongifolia*) is a gem and late flowering. It is much dwarfer in habit and generally ten days or a fortnight after the type in coming into bloom. The flowers appear in short racemes. *A. oligocarpa* is a dwarf-growing shrub of considerable beauty, but unfortunately very uncommon. It grows about four feet high and bears large, pure white flowers generally in pairs on well-matured wood. For small gardens the dwarf June Berry (*A. alnifolia*) is worth remembering, as it rarely exceeds eight feet high and flowers rather late in the season. Its flowers, like those of *A. canadensis*, are produced lavishly, and the autumn-tinted foliage is strikingly beautiful.

Amorphas.—These are in their way useful shrubs, the best of which is *A. canescens* (Lead Plant), introduced from Missouri in the early part of the present century. It grows about three feet high, flowers in autumn, is quite hardy, and free both in growth and bloom. Its deep blue flowers are borne in panicles and last a long time in fresh condition, and its silky white pinnate leaves are very attractive. A sandy soil with an open sunny aspect suits it admirably, and considering the

great time the Lead Plant has been in cultivation it is far from common in gardens. *A. fruticosa* (False Indigo), a well-known deciduous shrub, is more common than the last-named species. It is vigorous and grows half-a-dozen feet high when planted in sandy soil, and produces purplish-blue flowers in rather short spikes during summer. This shrub flowers more freely when cut back every year, as the blossom produced on young growths is much finer than that on neglected bushes.

Andromeda polifolia (*The Marsh Rosemary*) is during the summer months one of the brightest things in the shrubbery, and as it is so easily grown one often wonders why it is not more extensively used in gardens. There is an idea that this low-growing evergreen shrub seldom develops more than fifteen inches, succeeding only in peaty soil. This is a mistake, because it flourishes and flowers profusely in loamy soil provided lime is absent and the drainage good. Its wiry shoots, bright green leaves, and its pale pink flowers borne in racemes are distinct, enduring, and very beautiful. The varieties, *major* and *angustifolia*, are practically described by their varietal names.

Aralia chinenis (syn. *Dimorphanthus mandschuricus*) is a Chinese tree introduced to this country upwards of sixty years ago. In a deciduous state its long, spiny, branchless stems are by no means attractive; but during the growing season, and in autumn when bearing its huge terminal panicles of small cream-white flowers, it is very effective, and has quite a tropical look. It is quite hardy and flourishes in poor soils. The Angelica tree (*A. spinosa*) was introduced from Virginia more than two hundred years ago, and like the last-named it blooms in autumn, in fact its cream-coloured flowers may be frequently seen as late as the middle of October, and even after that time. To see the full beauty of this plant it should be allowed plenty of room and generous treatment.

The **Arbutuses** (*Strawberry Trees*) are delightful subjects for the garden, especially if the soil is peaty, moist, well-drained, and the position screened from the north and east. Not only are they valued for their flowers, but also for their berries. The strawberry-like fruit of *A. Unedo* is very showy, and as the white bell-shaped flowers are borne at the same time the effect of a good-sized tree is very telling when suitably placed. *A. Unedo*, the most frequently planted kind, is of moderate growth, rarely developing more than twenty feet in height, with bright green leaves, forming a round-headed, well-balanced tree. It can be well recommended for planting on the outskirts of the lawn and near the sea-coast. It flowers in autumn. Several varieties differing from the type have been raised, and are now in gardens. They differ either in habit of growth, size, and colour of flower, and are fairly described by their varietal names. For instance, *A. U. quercifolia* has leaves not unlike those of some oaks. The variety *microphylla* is not only small in growth, but its deep green leaves are the smallest of all the Arbutuses. It is of slow growth and a serviceable evergreen shrub for small gardens. The variety *rubra*, also known as *A. Croomii*, is of more than ordinary merit. It grows freely and has large handsome leaves, while the young bark is of a pleasing shade of reddish brown, and quite distinct from that of any other member of the family. The

flowers are much larger than those of *A. Unedo*, and in colour almost red. *A. Menziesii* (syn. *A. procera*) is a free-growing tree, with beautiful rich green leaves coloured with a glaucous hue on the obverse sides, and the white fragrant flowers are carried in panicles. The orange-red fruit is not so large as that of the common Strawberry tree, but it is attractive all the same. *A. Andrachne*, occasionally met with under the name of *integrifolia*, is quite as hardy as the type and certainly very ornamental. It was introduced from the Levant in 1874, is vigorous, with large leaves, and bears dull white flowers abundantly in May and June. The bark of the young shoots is tinged with red. *A. hybrida* (*A. photiniæfolia*), supposed to be a cross between the last-named and the type, is very handsome and bears some resemblance to both parents. Its leaves are very leathery and rich green, and the greenish-yellow flowers are produced profusely. Its crimson-stained fruit is conspicuous in spring.

Arundinaria. *See* Bambusa.

The growth of Ornamental Grasses should be encouraged, as they are graceful and beautiful, and although the

Arundos are not the most elegant, they possess a distinct charm which appeals to the planter. The type *A. Donax* (Great Reed) grows about a dozen feet in height, with stout almost erect stems and long, narrow, glaucous leaves. It delights in a moist soil, such as one finds near the edges of water, a sunny position in preference to a shady one, as the growth is always better for being exposed to the sun, especially if delugings of water can be given during summer. The silver variegated form (*A. D. variegata*) is less vigorous than the type, but very beautiful. Its leaves are short, tender, green, and streaked with cream white. This kind should never be planted in cold soil and bleak situations, as it is apt to lose colour and become disfigured by cold winds. It succeeds well as a pot plant for indoor decoration, but when root room is restricted, it should never be allowed to want for water. The variety *macrophylla* is vigorous, hardy, and elegant, and a grand plant for the sub-tropical garden. Its strong stems are clothed with glaucous leaves. The New Zealand Reed (*A. conspicua*) is a fine species, and when bearing its graceful, feathery plumes during summer and autumn, is remarkably pretty. Its arching leaves are long and narrow.

Aucuba japonica and its varieties are familiar garden shrubs, very useful and ornamental both in foliage and in fruit. Be careful to get plants of both male and female kinds, so that the flowers of the latter may become fertilised, because if berries are desired, both sexes must be in association. They are excellent shrubs for town gardens, as they endure fog and smoke better than the majority of evergreens. They are also serviceable for placing upon balconies, for winter bedding, and can also be recommended for planting in the shade of trees.

Azaleas. *See* Rhododendrons.

Azaras come from Chili, and, north of London, require protection during severe winters—usually that afforded by a wall being sufficient. They succeed in ordinary soil, provided it is well drained. *A. microphylla*, introduced nearly thirty years ago, is the most graceful member of the group, and grows freely in most situations, provided it

can be screened from east winds. It forms a dense shrub, with long branches of graceful outline, and numerous small, dark green leaves. In favourable seasons thoroughly established plants produce small, inattractive, but very sweet-scented flowers. *A. Gilliesi* is vigorous, but, unfortunately, rather more tender. It should be represented in the wall garden. Its holly-like leaves are very handsome, toothed, glossy green, and its rich yellow flowers are borne in axillary panicles.

Bamboos.—To facilitate reference, Bambusa, Arundinaria, and Phyllostachys are here brought under the general heading of Bamboos, as they are closely allied to each other. No plants give a more tropical appearance to the landscape than suitably placed, healthy Bamboos.

During the past few years considerable interest has been aroused in this family, the effect of plants in certain positions, hardiness, and general ornamental qualities being referred to in the horticultural press. To prevent disappointment, a few preliminary remarks respecting culture and aspect may not be without value. In the first place, a position screened from the east and north is essential, also a deep, rich, moist soil in which leaf-mould forms a large part. A yearly top-dressing of manure or leaf-mould greatly benefits them, and while growth is in progress frequent soakings of water will be of immense value. A mistake, unfortunately too often made in the culture of these graceful plants, is, that they are disturbed at the root at the wrong time of the year. Never move them in winter, but wait until the end of May or even the month of June before dividing them, because at that time fresh growth is being formed, and they then move with ease and certainty, the roots are quickly re-established, and the plants grow away as though they had not been interfered with. They are very graceful by the water margin, as well as single specimens on the lawn, and also for sub-tropical gardening. *Bambusa tessellata*, also known under the name of *Ragamowski*, a fairly well-known kind, is of close, compact, dwarf habit, and very distinct. Its broad, rich green leaves are quite fifteen inches long. *B. marmorata* also belongs to the dwarf section, and requires a warm spot to bring out its true beauty, a cold, bleak situation being most unsuitable for this dainty little Bamboo, with its slim dark stems and short, rich green leaves. *B. palmata* spreads rapidly, and delights in partial shade. Its broad, bright green leaves are large and handsome. The smallest of all Bamboos is *B. pygmæa*, well adapted for the wild garden, and is also serviceable for permanent edgings. It spreads with exceptional freedom, and soon forms a dense carpet of greenery.

Arundinaria Falconeri, with its slender stems a dozen feet or more long, supplied with rich green leaves, is pretty if planted in a sheltered ravine. *A. Hindsii* is also conspicuous for its erect stems and dark green foliage. *A. Fortunei* (*Bambusa Fortunei variegata*) is a neat and ornamental grass, a foot or so high, suitable for adorning the front of the shrubbery, or for growing in pots for placing in cool greenhouses. It is quite hardy, and its narrow pale green leaves, striped with white, are very effective. *A. auricoma*, better known as the golden form of *Bambusa Fortunei*, is indigenous to Japan, and grows about three feet high. It spreads rapidly, and its yellowish green leaves are regularly

BAMBOOS AT ABBOTSBURY, DORSETSHIRE.

striped with green. *A. japonica*, well-known as *Bambusa Metake*, is the most frequently planted kind, and certainly the least exacting of the vigorous Bamboos, because it not only grows luxuriantly in damp soils, but is quite a success in dry situations. Its long arching growths, and broad, deep green leaves are graceful and distinct. As it increases quickly at the base, it should not be restricted for root room. *A. Simoni* (*Bambusa Simoni*) is vigorous, graceful, and perfectly hardy. It grows from a dozen feet to sixteen feet high, and its arching shoots, and long, narrow, light green leaves are pretty. *A. nitida*, with its purplish-brown stems, short branches, and pale green leaves, is one of the most handsome of Bamboos when suitably placed. It prefers partial shade to full sunlight, and as it is of vigorous growth plenty of head-room should be allowed for its graceful outline. *A. Veitchii* (syn. *Bambusa Veitchii*) is dwarf, vigorous, and very attractive, and its broad leaves are of a pleasing shade of green.

Phyllostachys nigra (*Bambusa nigra*), with its long dark purple stems, is one of the most pleasing of vigorous Bamboos. *P. castillonis* (*Bambusa castillonis*) produces long stems clothed with bright green leaves marked with white. It is of good growth and thoroughly hardy. Another particularly handsome sort is *viridi-glaucescens*, with long elegant growths and glaucous leaves. *P. Quilioi* is another tall-growing species, with arching growths and deep green leaves. *P. aurea* (*Bambusa aurea*), the Golden Bamboo, is very showy. It grows upwards of a dozen feet in height, and its graceful stems, as well as its leaves, are of a golden-yellow colour, hence the name Golden Bamboo.

The **Berberis** family forms an attractive group of hardy shrubs of medium growth. They all flower in spring and early summer, and some are remarkable for the free display of showy fruits in autumn, which in some cases hang upon the leafless bushes until Christmas. The decaying foliage assumes gorgeous tints. They do not need special care in the preparation of soil or position; in fact, it is well to remember that the purple-leaved form of the common Barberry always gives the best results in rather dry, gravelly soil, because if planted in very rich compost it is apt to become coarse and lose much of its purple tint. Experience proves that the best colour effects are obtained if the whole of the vigorous shoots of this ornamental shrub are cut down every year close to the soil, because the leaves are bigger and the purple colour more intense than is the case with plants left uncut. For the sake of its brightly-coloured fruits in autumn the type is too valuable to pass by unnoticed. It should be planted in the pleasure-grounds. *B. vulgaris brachybotrys* and *B. v. macrocarpa* are attractive at flowering-time. *B. v. amurensis* has glowing scarlet berries, which are borne with great freedom during the autumn. It is of good growth. Another variety of the common Barberry noted for its beauty is named *asperma*; it is very bright, with strings of scarlet berries, and is a shrub of upright habit. *B. Thunbergi* is the most brilliant autumn coloured Barberry grown, and was introduced from Japan seventeen years ago. It is an excellent shrub for small gardens, as it seldom grows more than three feet high. It bears small drooping flowers, and in autumn its leaves are aglow with

subtle shades of orange, chocolate brown, crimson, &c. Few shrubs have such autumn foliage as this. *B. sinensis*, a Chinese species, is very free and pretty in autumn when laden with its showy fruits, at which time its brilliant crimson leaves stand out conspicuously in the shrubbery. It is of dense, bushy growth. *B. aristata*, from Nepaul, has reddish-coloured bark, and creates a pretty picture in winter. It grows six feet high, with stiff branches and bright green leaves. The rich yellow flowers, borne in racemes, are succeeded by scarlet berries, and these alone entitle it to consideration. *B. virescens* is another Barberry with brightly-coloured bark, and makes an effective winter shrub by the water side. *B. wallichiana* is quite distinct from all the foregoing. Free in growth, delightful in blossom, it forms a neat, much-branched bush, with clusters of shining leaves and masses of drooping flowers.

Darwin's Barberry (*B. Darwini*) is the best-known member of the evergreen group, and certainly one of the most useful. It is serviceable for hedge-making, and when grown in masses on a sunny bank the effect at flowering-time is magnificent. It grows from six to twelve feet in height, with strong shoots clothed with small glossy green leaves, and from about the middle of April to the end of May bears great quantities of orange-yellow flowers in rather short drooping racemes. *B. congestiflora hakeoides*, an uncommon early-flowering Barberry, bears deep yellow flowers profusely. It is of sturdy habit, rather slow in growth, and dislikes dull, shady positions. For general effect none surpass *B. stenophylla* either in graceful outline, abundance or beauty of flower. It is a hybrid raised between Darwin's Barberry and *B. empetrifolia*, a small-leaved, trailing, rock-garden shrub. The progeny is of excellent growth, with very long arching shoots and narrow deep green leaves, and during May and June produces a wonderful profusion of dainty yellow flowers. *B. buxifolia*, also known as *B. dulcis*, has large, drooping, light yellow flowers and tiny, deep green, box-like leaves. This showy Chilian shrub is, unfortunately, seldom met with outside good collections of trees and shrubs. *B. Aquifolium*, known also as *Mahonia aquifolia*, is quite common. It is an ornamental berry-producing plant, and the autumn and winter colouring of its leaves is charming. It is a valuable shrub for planting beneath the shade of trees. The varieties *rotundifolia* and *fascicularis* are handsome too. *B. japonica* is distinct, vigorous, and very ornamental. It produces a strong stem and large spiny leaves, composed of many leaflets and sweet-scented yellow flowers in winter and early spring. *B. nepalensis* (*B. Bealei*) is another beautiful kind deserving attention. It is free in growth, floriferous, and bears an abundance of purplish-coloured berries. *B. nervosa* (*B. glumacea*) is suitable for the rock-garden, as it is dwarf and very pretty. Its leaves are deep green, and it bears racemes of flowers from October onwards.

Bryanthus erectus is a dwarf evergreen for the rock-garden, as well as a permanent edging to dwarf shrubs. Although it grows in ordinary soil, it makes the best growth and yields the greatest profusion of small, delicate, rose-pink flowers in terminal clusters in peaty soil, and a position just beyond the influence of fierce sunlight. If the

ground is properly drained, partially shaded, and occasional soakings of water are given while growth is young, a brilliant flower display follows. This exquisite little shrub is far too seldom seen. *B. empetriformis* is also delightfully free, and, like the last named, of dwarf growth; it is very uncommon. Its rosy-purple flowers are borne in early summer.

Buddleia globosa (*Orange Ball Tree*) is the hardiest member of a rather extensive family. In addition to its hardiness, it is also easily placed, and flourishes in almost any soil. It is an excellent seaside shrub, in which situation it not only grows luxuriantly, but blossoms profusely. It does not often grow more than twelve feet high, but a plant of such a size, when displaying its wealth of orange-coloured, ball-like flowers, is the most conspicuous shrub in flower in late summer. It is half an evergreen, and its long, pointed green leaves are covered with a glaucous tomentum on the lower surface. *B. lindleyana* differs from *B. globosa* by reason of its dwarfer habit, somewhat tender constitution, and purplish-red flowers, borne in long, terminal racemes. It should be planted against a wall.

Buxus (*Box*).—The native Box Tree (*Buxus sempervirens*) is so familiar that it is not necessary to consider it at any length here, but some of its distinct and ornamental forms may well be referred to. The silver variegated variety is very handsome, keeps its colour well, and, like the type, succeeds in nearly all situations. Its pale green leaves are speckled with cream-white. A good companion to the last named is *B. s. aurea variegata.* Similar in habit, its leaves are heavily marked with yellow and white. The variety *rotundifolia* is of sturdy, bushy habit, and very distinct. The golden-leaved form of *B. japonica* is excellent for winter bedding. It is of compact habit, and its golden colour is permanent. The Minorca Box (*B. balearica*) delights in a dry bank facing south-west. It is of excellent growth when thus placed, and, as autumn approaches, its thick, polished green leaves are touched with bronze.

Cæsalpinia japonica is a pretty and uncommon leguminous shrub from Japan. It is suitable for massing, and its glossy green leaves are composed of numerous leaflets, while its rich, yellow flowers, with conspicuous anthers, are borne in long racemes with great freedom. Although it succeeds best in a peaty soil, it grows luxuriantly in loam, provided the drainage is good and the position open to the sun, but, at the same time, out of reach of cold easterly winds. It is a pity that such an attractive, free-growing shrub should be so seldom seen in gardens.

The **Calycanthuses** form a small group of American deciduous shrubs, varying from six feet to twelve feet in height. All have flowers of different shades of red, and some are more fragrant than others. They succeed in soils of various descriptions and aspects, but produce the best results when in a cool, moist soil, with the additional advantage of partial shade. *C. floridus*, the most popular of Allspices, was introduced to this country from America in the seventeenth century. It is perfectly hardy, compact in growth, and its bright red, deliciously-scented flowers are about the size of a five-shilling piece, and borne

freely. *C. occidentalis*, which is the same as *macrophyllus* (Western Allspice), is more vigorous, and with larger flowers than the first named. The lively green leaves are also larger as well as the deep crimson flowers, but these are unfortunately rather scantily produced on small plants. To some the fragrance of the flowers of the popular Allspice is unpleasantly strong, but those of *C. glaucus* are not so fragrant. The colour is reddish-purple.

Caraganas are good town garden shrubs, and excellent for dry soils. The Siberian Pea Tree (*C. arborescens*) is the best known of the group, and the freest in growth and flower. Bright yellow is the colour of its pea-shaped flowers.

Carpenteria californica.—Wherever this charming Californian shrub can be successfully grown it should be represented, as it bears beautiful flowers. It delights in peat, loam, and leaf-mould in equal proportions, and good drainage is of great importance. Be careful, too, not to expose it to cold east and north-east winds as these do considerable damage to young growth. It grows about a dozen feet in height, and has greyish-green leaves, whilst its sweet-scented, pure white flowers with conspicuous golden-yellow stamens in the centre, are produced in clusters at the points of the growths.

Cassandra calyculata (*Andromeda calyculata*).—A freely-branched, low-growing North American shrub, producing a good effect when planted in large masses near the edge of water, as it succeeds best in a cool, moist root-run. Its wiry shoots are clothed with small bright green leaves, and in early spring small bell-shaped flowers appear in quantity. It is thoroughly hardy and prefers full exposure to partial shade.

Cassinia fulvida, also known under the name of *Diplopappus chrysophyllus*, hails from New Zealand, and forms a medium-sized, much branched shrub, with slender bright yellow stems and tiny green leaves, bright yellow on the under sides. It bears creamy-white flowers in terminal panicles in autumn, and these are conspicuous for two or three months. It is a good seaside shrub, and an open sunny spot favours good growth and the production of flowers.

Catalpas are handsome trees for the garden, delighting in poor soils, and flowers appear when few trees and shrubs are in bloom. They are excellent for planting on the lawn, and can be well recommended for towns. *C. bignonioides*, not infrequently called *syringæfolia*, the well-known Indian Bean Tree, is a North American species of vigorous growth, and often reaches twenty-five feet high, with a dense-spreading head. Its V-shaped leaves are bright green, flushed with bronze towards the margins, and quite downy on the under sides. During summer it bears at the branch tips erect spikes of blush white flowers, suffused with violet and purple in the yellow throat. It is very free. The golden-leaved variety (*aurea*) is less vigorous, but exceedingly ornamental. It is a yellow-leaved counterpart of the type, and may be planted in the shrubbery or as single specimens on the lawn with telling effect, and if the shoots made during the previous year are cut hard back in February the foliage is larger and richer in colour. *C. cordifolia* (*C. speciosa*) is even more ornamental than the first named,

THE CATALPA IN FLOWER IN A LONDON GARDEN.

and perfectly hardy. It also blooms early, and the flowers are larger and brighter in colour. It is free in growth, and a first-rate shade tree. Catalpas like moisture, and this is the reason why the trees are so luxurious and shapely in the gardens of the Thames valley.

Caryopteris mastacanthus produces pretty light-blue flowers over a considerable period in autumn, a time when shrubs in flower are scarce, consequently its value is enhanced. It is not, unfortunately, hardy generally, but is well worth a place against a wall. Avoid planting in cold, bleak situations, and use, if possible, a soil consisting of fibrous loam and leaf-mould, with the addition of a little coarse silver sand or grit. To insure a thorough ripening of the wood, select a sunny position. The white-flowered form is not so hardy as the type, and the flowers are produced rather sparingly.

The **Ceanothuses** are delightfully free-flowering shrubs, but unfortunately not sufficiently hardy for general outdoor planting north of London, as they suffer in severe winters. For clothing warm walls, especially if the soil is fairly rich and the drainage ample, they are excellent, and few shrubs are more brilliant in summer. *C. americanus* (New Jersey Tea) comes from America, and bears an abundance of white flowers; it is very hardy and ornamental. *C. veitchianus*, from California, is of free growth, and very showy when bearing its clusters of bright blue flowers. *C. dentatus* has deeply-toothed leaves and rich blue flowers, borne in advance of those of the last named. It is very free-flowering, and continues in blossom for about four months. *C. papillosus* and *C. verrucosus* are very floriferous and ornamental. *C. azureus*, introduced from Mexico upwards of seventy years ago, is a compact, free-growing shrub, often many feet in height when suitably placed. Its bright blue flowers appear from midsummer onwards. The writer is acquainted with a gardener at Ealing in Middlesex, where the shrub has grown to the roof; the aspect is south. Of the many beautiful garden forms belonging to this species the following are worthy of mention here. Gloire de Versailles is the most popular. It is free in growth, with large leaves, and bright blue flowers, borne in long racemes. Marie Simon is another good kind; and Albert Pettitt, Lucy Simon, Albidus, and Arnoldi are noteworthy too.

Cerasus Lauro-Cerasus (*Common Laurel*) is a shrub that has been over-planted. It should, if possible, be kept out of the choice shrubbery border, as its hungry roots rob everything else of nourishment. It may be planted as shelter. The varieties known as the Colchic and Caucasian are of quick growth, and *rotundifolia* should be planted freely, but perhaps the most distinct variety of the Common Laurel is that named *camelliæfolia*, with rich polished green leaves. It is perfectly hardy.

The Portugal Laurel (*C. lusitanica*) makes a handsome shrub or small tree, twenty feet or so in height. It is perfectly hardy, of spreading habit, and of free growth, even in poor soils.

Cercis Siliquastrum (*Judas Tree*) is a beautiful tree when laden with its wealth of rosy-purple blossoms, which appear in spring before the kidney-shaped, glossy green leaves. It is a small growing, freely

branched tree, and succeeds fairly well in dry sandy soil, but it produces the best growth by the lake or stream side, and in such a position the flowers are not only deeper in colour, but they remain in good condition for a much longer time than those produced in sandy soil. It may be planted also against a wall.

Chimonanthus fragrans.—The exquisite Winter Sweet should be represented in every garden where hardy shrubs are treasured for their flowers. It was introduced from Japan upwards of one hundred and thirty years ago, and is of strong growth, especially when planted in deep, rich, moist soil, and as its soft yellow flowers are produced in midwinter along the leafless twigs, it should be given a prominent place to reveal its beauty. The variety *grandiflorus* bears larger flowers than the type, but they are not so strongly scented. The Chimonanthus flowers are borne on wood of the previous season's growth, consequently all pruning and thinning of the shoots should be attended to in early spring, as the full growing season is then available for the production of wood.

Chionanthus virginicus.—The Fringe Tree is a charming deciduous shrub with fragrant white thread-like flowers in great drooping clusters. It is a North American shrub; succeeds best in cool soil and partial shade. It has lately been used for forcing with considerable success for indoor decoration during winter. Hard forcing should be avoided, and the plants never allowed to want for water.

Choisya ternata (*Mexican Orange Flower*) is a precious shrub with bright evergreen foliage, and in spring each matured shoot bears a terminal cluster of white sweet-scented flowers, which are well adapted for placing in bowls for room decoration, as they can be cut with their own foliage. It also blooms in autumn and during very mild winters. The Mexican Orange Flower is hardy in most parts of the British Isles, is bushy, of free growth, and flourishes in ordinary soil. It should be planted liberally, as it is one of the gems of the shrub garden. It is not advisable to expose it to cold east winds, and a few plants in pots make a welcome addition to shrubs suitable for forcing. In very cold localities space should be reserved for it against a wall. Cuttings of young shoots taken off about midsummer and planted in light soil and placed in a warm case emit roots in about a fortnight.

The **Rock Roses**, or **Gum Cistuses**, are excellent shrubs for dry banks, particularly if facing south or south-west, because it is only on perfectly ripened shoots that flowers are produced, and although the latter are of such fleeting duration they are borne in profusion over a long period. *C. florentinus* is a charming kind, neat in growth and very free-flowering. Its white flowers are blotched with yellow. *C. ladaniferus*, the typical Gum Cistus, has thick sticky leaves and bold white flowers blotched with purple. A grand plant for the sea-coast, *C. villosus*, bears lilac-coloured flowers suffused with purple. *C. ladaniferus* is another pretty free-flowering kind, and quite hardy. Its flowers are white.

Citrus trifoliata, introduced from Japan upwards of thirty years ago, deserves mention not only for its quaint growth, but

also for its small, sweet-scented, white, orange-like blossoms, which are borne along the spiny branches. It is slow in growth, and should, if possible, be planted in small groups on the turf, selecting of course a sunny position so as to insure thorough ripening of the wood. It succeeds best in turfy loam, with which has been incorporated a quantity of leaf-mould. Good drainage is of much importance, because it fails when the roots travel into sour soil.

Clerodendron trichotomum.—Here we have another autumn-flowering shrub or small tree, introduced a hundred years ago. It is vigorous and distinct both in foliage and in flower, its ovate deep green leaves changing in autumn to shades of orange and red, and its sweet-scented flowers appear abundantly in terminal cymes, the conspicuous purple calyces affording additional beauty. It delights in a rich, well-drained soil, and protection from piercing winds is essential.

Clethras.—Few hardy Clethras are cultivated in this country, still they are exceedingly ornamental, easily grown, and all have fragrant flowers. They grow well in fibrous loam, but prefer a moist, peaty soil. *C. alnifolia* (the Alder-leaved Pepper-Tree) is rarely more than five feet high, and bears a great profusion of small white flowers towards mid-summer. The variety *tomentosa* should be grown for its flower display. It is of similar habit to the type, but the flowers are bigger and borne at least three weeks later.

The **Coluteas** (*Bladder Sennas*) are very accommodating shrubs, as there is scarcely a position in which they refuse to grow. No soil, however poor, comes amiss to them, as they grow freely and flower profusely in wet as well as in dry situations. They are also excellent shrubs for smoky districts. It is a good plan to cut them hard back every spring, as vigorous growth follows close pruning. There is a profusion of bladder-like seed-pods, at first red, then changing to orange-yellow in autumn.

The **Dogwoods** (*Cornus*) are deciduous shrubs of free growth. They comprise silver, gold, and green-leaved forms, and some, like *C. florida* and *C. Kousa*, are valuable flowering shrubs, and *C. alba* is one of the most effective of red stemmed shrubs in winter; it is an excellent kind for planting along the water margin, as the reflection of the bark in the water in winter makes warm colouring in the garden. *Sibirica* is a good variety. *Spathi* is a brilliant golden-leaved shrub, and does not burn in hot suns as in the case of the majority of yellow-leaved shrubs. Its delicate pale green leaves are marked with yellow and irregularly bordered with a deeper shade. *C. macrophylla* has bright green leaves, which in autumn are heavily shaded with red. It is conspicuous in early summer when bearing its large clusters of white flowers. The Cornelian Cherry (*C. Mas*) is a small growing tree of erect bushy habit with slender branches, and in February bears clusters of small yellow flowers. It grows freely in dry soil.

The genus **Corylopsis** contains several uncommon deciduous shrubs of much merit; they are quite hardy, dwarf, and delightfully free, well deserving a place against a west wall, as the flowers are seen there to better advantage than when on plants in the open shrubbery. *C. spicata*,

a Japanese shrub, is the choicest member of the genus, and in February carries sweet-scented yellowish flowers in drooping spikes. *C. himalayana* is taller and more vigorous than the last named, and *C. pauciflora* is not, as its name leads one to suppose, shy flowering. It is a welcome free-flowering shrub.

Cotoneasters.—Here we have a group of useful trees and shrubs, thoroughly hardy, free in growth, and charming when laden with their clusters of richly-coloured berries in autumn. Ordinary soil suits them. The vigorous *C. buxifolia* has small deep green box-like leaves, bears an abundance of white flowers in clusters, and bright red berries in autumn. *C. rotundifolia*, a Himalayan species, grows about six feet high, is rather slow in growth, free in blossom, and retains its richly-coloured berries throughout the winter. *C. microphylla*, also from the Himalayas, is a close growing evergreen shrub of excellent habit, and the best of the Cotoneasters for clothing ugly walls. Its leaves are small, very deep green, and its delicate blush white flowers are succeeded by attractive berries. *C. frigida* is very pleasing in flower as well as in fruit. It forms a small tree. *C. Simonsi*, also free in growth, is another conspicuous autumn shrub. Its berries are bright red and borne in great profusion; a most useful kind for town and country gardens. *C. horizontalis* is more beautiful in autumn than all its brethren. It bears a quantity of bright berries, and the foliage dies off with resplendent hues. It is of low-spreading habit, and delights in a sunny spot to bring out its leaf colours.

Cratægus (*Thorn*).—A lovely group of free-growing small trees, well adapted for the small garden. They vary considerably in habit of growth, as well as in the colour and size of flower, and are essentially spring-flowering. Few trees of similar growth are more effective at that period of the year. Many of them, too, bear a profusion of brilliant fruits in autumn and winter. *C. Crus-galli* (Cockspur Thorn), from North America, has long stiff spines, with which the branches are beset. Its large flowers are white, and succeeded by numerous clusters of crimson fruits, which are sometimes retained upon the leafless branches until spring. The brilliant tinted foliage also hangs upon the trees for a long time. The varieties *prunifolia* and *ovalifolia* are also showy autumn shrubs. *C. Aronia* makes an admirable specimen for the lawn, being of graceful habit and flowering after many of the Thorns have lost their blossom beauty. Its large yellow fruits are showy and borne with great freedom. *C. pinnatifida* begins growth early in spring, and in autumn its deeply cut leaves are heavily suffused with orange-yellow. Its fruits are large and handsome. *C. coccinea*, the North American scarlet-fruited Thorn, grows freely in moist soil, forming a well-balanced head, and when laden with its white flower-clusters in April and May it is strikingly beautiful. It seldom grows more than twenty-five feet in height, and its rich green leaves change in autumn to brilliant crimson, at which time its showy fruits appear in profusion. The variety *macrantha* is another very fine autumnal tinted tree. *C. Azarolus* is of free, almost erect, growth, with sweet-scented white flowers, succeeded by orange-red fruits. *C. heterophylla*,

known also as *C. multiflora*, is of excellent growth, very free, and bears crimson fruit. *C. tanacetifolia* (Tansy-leaved Thorn) is very beautiful, having much cut grey leaves and sweet-scented flowers and yellow fruits. It blooms quite late. *C. Carrieri* is free in growth and very ornamental. Its large orange-red fruits are showy and hang upon the tree generally until spring. *C. Douglasi* is vigorous, flowers early, and has dark fruits. The Washington Thorn (*C. cordata*) is a conspicuous autumn shrub, wtih great corymbs of white flowers late in spring and showy fruit in autumn. Amongst the numerous varieties of the Common Thorn the following are especially good:—*Lucida*, flowers double white; *flore pleno coccinea*, flowers double scarlet; *flore pleno rosea*, flowers double, rose coloured; *flore puniceo*, flowers single red; *atrofusca*, weeping habit, flowers white. Paul's Scarlet is a very bright kind. *C. Pyracantha* (Evergreen Fire Thorn) is a well-known shrub, usually planted against a wall, and is one of the most attractive of shrubs for this purpose. The berries are borne in clusters, and if birds are kept off, will remain fresh for the greater part of the winter.

Cytisus (*Broom*).—This is a fairly large group of shrubs, with pea-shaped flowers. Ordinary soil suits them, and they succeed well in dry situations. Those mentioned are perfectly hardy and satisfactory in all ways. *C. biflorus* is of sturdy growth and very free-flowering. Its bright yellow flowers are borne in clusters. The Black Cytisus (*C. nigricans*), from Austria, bears rich yellow flowers in erect racemes towards midsummer. *C. præcox*, a hybrid between *C. albus* and *C. purgans*, is a grand shrub for massing. In habit it is less vigorous than the White Broom. The flowers are sulphur yellow. *C. capitatus* is a much branched bush, four feet high, with bright yellow flowers at the points of the growths. *C. purgans* is a charming free-growing and free-flowering dwarf shrub. Its flowers are bright yellow. *C. purpureus* is another good dwarf spreading shrub, which begins to blossom in May and keeps up a succession of dull purple flowers until autumn. As it is of procumbent habit it deserves a place in the rock-garden. *C. kewensis* is another rock-garden Cytisus, raised by crossing *C. Ardoini* with *C. albus*. It is of creeping habit, and bears a profusion of cream-coloured flowers. *C. albus* (White Broom), *C. scoparius* (Yellow Broom) are too well known to need description, and *andreanus*, a variety of the last named, also known as *Genista andreana*, is very showy and blooms profusely.

Groups of the White and Common Broom are very beautiful and are the shrubs to plant in rough places, where one wants to preserve a wild free growth.

Dabœcia polifolia (*St. Dabeoc's Heath*), and its varieties, *alba* and *bicolor*, are exceptionally pretty free-flowering dwarf evergreens, which seem to flourish best in damp peaty soil. They are just the kind of shrubs for planting in masses at the foot of the rock-garden, as their neat habit fits them for such a position. The drooping flowers of each are borne in erect terminal racemes in summer and autumn. The type has crimson-purple flowers; *alba*, white; and *bicolor*, white and purple on the same plant.

Daphnes.—These are low-growing, deciduous, and evergreen shrubs,

native of Europe. Japan, China, &c. The family is a fairly large one, and many species are suitable for open air culture in this country. They should be planted in rich soil of good depth, and as they require plenty of water while growth is being made, perfect drainage should be provided. It is also advisable to shield them from cold winds. Few shrubs are more welcome during winter and early spring than the Mezereon (*D. Mezereum*), when its sturdy leafless branches are crowded with small clusters of rosy-purple, deliciously-scented flowers. It is a good shrub for grouping, and flowers most freely in an open spot shielded from the sun in the hottest part of the day. There is a variety with white flowers (*alba*), and another with red flowers (*autumnalis*). The last named is a good garden shrub, not only for its richly-coloured flowers, but because they are produced over such a long period. It is not unusual for it to keep up a succession of bloom for about four months. *D. Genkwa*, from Japan, should be planted extensively, as its hardiness is thoroughly established, and its flowers are of distinct colour. It forms a loose, bushy, free-growing shrub, with slender branches, and when laden with its delicate lilac-shaded flowers is very handsome. One of the most dainty of evergreen Daphnes is undoubtedly *D. blagayana*, introduced nearly forty years ago from Syria. Notwithstanding its hardiness, freedom, and the fact that its sweet-scented, ivory-white flowers appear in March, it is by no means common. *D. alpina* is a charming little plant from the European Alps, and quite at home in the rock-garden. It is neat in growth, and bears pinkish-white blossoms in early spring. The Garland Flower (*D. Cneorum*) is another fine rock-garden Daphne; it is dwarf, compact, free in growth, and has delightful blossoms. Few flowering shrubs of similar growth create a better effect than the Garland Flower when displaying its rose-coloured fragrant blossoms at the ends of the growths, and these remain fresh and attractive for a considerable time. *D. Laureola* (Spurge Laurel) and *D. pontica* are valuable principally because they flourish under the drip of trees. The flowers of both species are greenish-yellow and fragrant. *D. sericea*, known also as *D. collina*, is a distinct and beautiful species of dwarf habit, with deep green leaves and large clusters of sweet-scented, rose-coloured flowers.

Desfontainea spinosa should have a place against a warm wall, as it is not sufficiently hardy to endure open-air culture in all parts of the British Isles. It is a sturdy, holly-like shrub from Chili, and when planted in rich soil and well supplied with water in spring produces a wealth of drooping scarlet and yellow flowers.

Deutzias.—These are ornamental deciduous shrubs with, as a rule, white flowers. They are quite hardy, free in growth, floriferous, and useful for forcing as well as for giving variety to the shrubbery border. *D. gracilis*, a slender-growing shrub two feet or so high, is in great demand for forcing, as its flowers readily respond to gentle heat. Its variety *Lemoinei* is of erect sturdier growth, and its pure white flowers appear in neat trusses. *D. corymbiflora* should be included in a select list of Deutzias. It is a distinct kind, with large graceful panicles of snow-white flowers. *D. crenata*, known also as *D. scabra*, is vigorous and

very handsome. Its pure white flowers are borne in racemes freely, and it grows about eight feet high. The variety *punctata* is very showy, has variegated foliage; and the double-flowered form, named *flore pleno*, is heavily shaded with reddish-purple. Pride of Rochester is another excellent variety with double flowers, but in this case they are pure white.

Diervillas, better known in gardens as Weigelas, or Bush Honeysuckles, form a delightful group of free-growing shrubs with bell-shaped blossoms of varied colour. They are quite hardy and succeed well in sandy soil; but the greatest display is obtained when planted in fibrous loam with which has been incorporated a good quantity of leaf-soil. Bush Honeysuckles love a sunny position. The stock can be readily increased by cuttings taken off in August and planted in sandy soil and placed in gentle heat. Beyond the removal of worn-out growths and the sappy shoots little or no pruning is required. *D. grandiflora* flowers early and remains attractive for several weeks. It has rose-pink flowers in abundance. *Rosea* bears rose-coloured flowers in April and May. *Hortensis nivea* has pure white blossom, and is very free and lasting. *Looymansi aurea* is conspicuous, as it has golden-coloured foliage, which fortunately does not burn in the sun. In spring the leaves are bright yellow and in autumn heavily stained with brown. Abel Carriere is a beautiful variety with large reddish-carmine flowers, produced abundantly. Eva Rathke is decidedly the best of the later flowering kinds, and should be in all gardens where attractive deciduous shrubs are admired. It is of bushy growth, free-blooming, and its medium-sized flowers, of a deep purplish-crimson hue, are borne from midsummer until late autumn.

Elæagnuses.—These are valuable, and include deciduous and evergreen kinds. They are of the simplest culture and thoroughly hardy. For planting on dry banks the variegated evergreen Oleasters are a success, and if the position is a sunny one the leaf colouration is particularly bright during winter. They are also excellent for planting as single specimens on the fringe of the lawn, and few shrubs are better adapted than the evergreen Oleasters for clothing ugly walls. *E. augustifolia*, from Southern Europe, forms quite a tree, and needs plenty of head room to display its true beauty. It has narrow leaves, light green with a white reverse, and its clusters of delightfully fragrant full yellow flowers borne in the leaf axils are succeeded by showy fruits. *E. longipes* grows about eight feet high and as much or more through, and flourishes in hungry soils. It is a very handsome shrub when in fruit, and is worth planting largely for this reason. The North American Silver Berry (*E. argentea*) is another beautiful deciduous species, with sweet-scented flowers. It has silvered leaves, and the clusters of yellowish flowers are followed by roundish berries. *E. umbellata* is an ornamental Japanese species. It is of good growth, and during summer bears cream-coloured flowers. *E. macrophylla*, a Japanese species of robust growth, has a lavish display in winter of greenish-yellow flowers. Its bright green leaves are powdered on the under sides with white, and when ruffled by the wind a pleasing effect is created. *E. pungens* is a bold green-

leaved winter-flowering species; but its golden-leaved form (*aurea*) is the showiest of the group. It is strong in growth, and the greater part of its leaves are rich yellow slightly margined with pale green. A grand shrub for the lawn.

Empetrum nigrum (*The Native Crowberry*) flourishes in soil suitable for Heaths. It is a neat evergreen shrub, well adapted for edging beds, and is also worthy of a place in a shady nook in the rock-garden. It has small pink flowers and dark berries.

The hardy **Ericas** (*Heaths*) are quite unfamiliar in many gardens. The general belief that they only make satisfactory growth in peaty soil is wrong, as they grow freely and flower abundantly in loamy soil provided it is sweet, suitably drained, and free from lime. If an annual surface dressing of leaf-mould can be given much good will result. They may be used in a variety of ways with excellent effect. For instance, the dwarf, cushion-like Heaths are serviceable for edgings to beds of low-growing American shrubs, while the taller growing kinds are not out of place in the shrubbery provided sunlight and air are not shut out. The flowers appear over a long period, and some of the kinds—viz., *lusitanica*, *mediterranea*, and its varieties—are produced when flowers are by no means plentiful out of doors. The following is a list of pretty Heaths suitable for the open garden, and it may be taken as representing the various groups. *E. lusitanica*, from Spain and Portugal, is rather tender, and at flowering time—between February and May—few Heaths are more pleasing. The drooping flowers are pale pink, almost white, and appear on almost every small twig. The Tree Heath (*E. arborea*) grows eight or nine feet high and flowers about the same time as the last named. Its flowers are white, a noble kind. *E. tetralix*, a native cross-leaved species, carries a profusion of delicate pink flowers towards midsummer. The red and white varieties are very beautiful, too, and delight in moist soil. *E. mediterranea* is a free-growing species, often reaching three feet in height, and is beautiful in mid-January with its pink flowers. The variety *hybrida* is an improvement on the type. It flowers early, is of erect habit, and exceptionally free. The pale pink flowers are very lasting. The Grey Heath (*E. cinerea*), a native species, grows about a foot high, and at midsummer has a profusion of purple flowers in terminal racemes. *E. carnea* (Winter Heath) is a jewel. It is neat in growth, wonderfully free, and flowers in the dead of the winter, the colour being a pleasant shade of rose-pink. The variety *alba* also deserves mention, as it flowers at the same time. Planters should make a note of these fine Heaths. The varieties of *E. Calluna vulgaris* are useful garden shrubs. Plant them by the margin of shrubberies, in the rock-garden, or as edgings to beds of Rhododendrons and Azaleas.

Escallonias are seaside shrubs, and some of them are very free. They form neat bushes, and for their foliage alone deserve greater recognition. In very cold localities plant them against a wall, as they are apt to suffer in very severe winters. They are all evergreen and flourish in ordinary soil, but dislike positions exposed to east winds. *E. macrantha*, the most frequently planted kind, is very handsome and

A VARIETY OF MEDITERRANEAN HEATH (ERICA MEDITERRANEA).

sturdy, with bright glossy green leaves and clusters of red flowers produced freely during summer. *E. philippiana* is not only the hardiest, but one of the most distinct and pleasing of Escallonias. It is a native of Valdivia, and was introduced to this country nearly thirty years ago. It is bushy, of free growth, with long arching shoots, narrow bright green leaves, and its dainty pure white blossoms appear in profusion. *E. sanguinea* also merits attention, as it is of excellent growth and bears a mass of showy flowers. *E. Langleyensis* is a most attractive hybrid raised between the two last-named kinds, *E. philippiana* being the female parent. Its small flowers are of a rose-pink shade, and as they are borne so liberally the plant, when in full flower, is particularly bright. *E. floribunda* bears white flowers, generally after the majority of the kinds have finished flowering, for which reason it is valuable for prolonging the display. It grows freely, and is of neat habit.

Eucryphia pinnatifolia, an uncommon shrub, introduced from Chili twenty years ago, bears pure white flowers with bright yellow stamens in the centre. It blooms in summer, and its handsome, bright green, pinnate leaves are tinged with brownish-orange and crimson in autumn. It requires a rich, perfectly drained soil and sheltered position, but at the same time one exposed to full sunlight is essential, because it never blooms well unless the wood is thoroughly matured. It forms a sturdy bush, and is rather slow in growth.

Euonymuses.—These include deciduous and evergreen shrubs, or small trees indigenous to Europe, North America, &c. Every one is of simple culture. None are conspicuous for showy flowers, but the deciduous kinds, particularly the Spindle Tree (*E. europæus*) and its varieties, are remarkably pretty in autumn with their richly coloured capsules. Many an English hedgerow is made bright with the ruddy berries. The autumn-tinted foliage, too, is very bright. *E. europæus* is well known, but some of its varieties are less frequently seen, the most important of which are:—*Atropurpurea*, which differs from the type in having deep purple leaves, shaded with orange in autumn. It has showy capsules and prominent seeds. The leaves of *aucubifolius* are bright green, spotted with yellow. The broad-leaved Spindle Tree (*E. latifolius*) is a fine shrub for the garden, and altogether finer than *E. europæus* both for its foliage and berries.

Of the evergreen kinds, the following list comprises a few of the best:—*E. japonicus latifolius albo-variegatus* has pretty silver leaves; Duc d'Anjou, green and gold; *macrophyllus*, broad deep green; *aureus*, yellow and pale green. *E. radicans* is well adapted for edging borders, as it stands the shears well, and is always of neat appearance. It also makes an excellent wall shrub. The variety, Silver Gem, is much stronger in growth than the type, and well deserves greater popularity. Its leaves are silvery white and pale green; a bright little plant for winter bedding. The other variegated forms are useful too.

Eurybia. *See* Olearia.

Exochorda grandiflora (*Pearl Bush*), known also as *Spiræa grandiflora*, is a Chinese species, perfectly hardy, of free growth, and flowers abundantly. In May it carries long racemes of snow-white

flowers. It is a much branched shrub, and grows from six to ten feet high. *E. Alberti* is pleasing and rarer than *E. grandiflora*. It is of stiff habit, and bears pure white blossoms, but they are not produced so freely as in the first named. A Pearl Bush in flower is very beautiful, like a drift of snow.

Forsythia.—This is a small group of bright early spring-flowering deciduous shrubs. They are quite hardy and grow in ordinary soil. The most useful kind is *F. suspensa*, a shrub with long slender growths, and in March when its drooping bell-shaped, rich yellow flowers appear, it is most effective. Planters should remember that the Forsythia flowers are borne in advance of the leaves, on which account care should be exercised at planting, and a suitable background secured to bring out the full beauty of the golden bells. It is amenable to various forms of culture. For instance, it is well adapted for training against a wall, securing only the principal growths and allowing the others to fall at will; and for covering pergolas, pillars, and similar arrangements it is of much use. *F. viridissima* is of very different growth to the last named. It is a sturdy, bushy shrub, with bright yellow bell-shaped flowers, and useful for planting in groups in the front of the border, but should never be placed where it is likely to get choked by taller and more vigorous things. *F. suspensa* is easily kept within reasonable bounds by a free use of the knife, as it stands hard pruning. Any cutting back should be done in spring just after the flowers have faded, as the plants then have the full growing season for the production of fresh wood.

Fraxinus excelsior (*Common Ash*) is at home more in the park and pleasure-ground than in the garden, but if space permits, room should be reserved for one or two of its varieties, especially that with golden bark so beautiful in winter. Its golden leafage is conspicuous in summer too. The silver-leaved variety (*foliis argenteis*), with tender green leaves profusely speckled with white, is a good summer companion to it, and that distinct Ash (*F. e. heterophylla*), known also as *simplicifolia*, deserves attention. It is vigorous and decidedly ornamental. Then there is the pendulous form of *Fraxinus excelsior*, one of the best of trees of weeping habit.

Amongst Flowering Ashes, *F. Ornus* grows upwards of twenty-five feet high, and is well adapted for planting on the lawn. It carries immense clusters of cream white flowers in early summer. *F. floribunda* (*Ornus floribunda*) is perhaps more vigorous, and certainly one of the best of Flowering Ashes. There is an uncommon Chinese species named *Mariesi*, which is very beautiful and distinct, but not so free in growth as those already referred to. Its pure white flowers appear rather late.

Fremontia californica.—This Californian deciduous shrub is too valuable to pass by notwithstanding its rather delicate constitution. Only in specially favoured localities should it be planted in the open shrubbery, as it is too tender for general use out of doors. It will give satisfaction, trained against a wall if planted in sandy loam, taking care not to choose a place exposed to east winds. It grows about twelve feet in height, and bears bright yellow flowers two inches across in early summer.

BRANCH OF THE SNOWDROP TREE (HALESIA TETRAPTERA).

Garrya elliptica.—Few evergreen shrubs are more ornamental in winter than a large wall plant of this Californian Shrub when covered with its elegant catkins, varying in length from eight inches to a foot, and borne at the tips of the previous season's growth. When planted in the ordinary shrubbery it seldom grows more than six feet high, but given rich soil and copious supplies of water while growth is in progress, it develops more strongly.

Gaultheria procumbens (*Creeping Winter Berry*).—A neat evergreen carpet shrub, introduced from North America; delights in a cool, moist, peaty soil, and partial shade. Towards midsummer it bears masses of small white drooping flowers, and in autumn and winter its small red berries are very bright. Its autumn-tinted foliage is another bright feature. *G. Shallon* is quite distinct from the last named, and grows about three feet high; it is a good evergreen for planting under trees, and small white flowers precede the purplish berries.

Genistas.—These are hardy shrubs of simple culture. *G. pilosa*, a procumbent British species, should be grown in the rock-garden in preference to the ordinary shrubbery. The same remark applies to *G. sagittalis* and *G. prostata*. All have bright flowers. The Spanish Broom (*G. hispanica*) is a treasure for dry banks, also as marginal lines to the shrubbery. It is a dense growing prickly shrub, and its rich yellow flowers appear in July, a succession being maintained for several weeks. *G. radiata*, occasionally met with as *Spartium radiatum*, a native of Southern Europe, grows about eighteen inches high, and bears yellow flowers in terminal heads in July. *G. ætnensis*, popularly known as Etna Broom, is an old garden shrub, and in late summer, when bearing its wealth of golden-coloured pea-shaped flowers, produces a striking effect. It should be planted in groups, as the effect in a mass is more telling than that produced by the wretched "dot" system. The seed-pods which succeed the flowers are showy too. *G. virgata* is the best of the taller growing species for planting in poor hungry soils. It is of free growth, and its bright yellow flowers are not only borne abundantly, but they remain attractive for a considerable period.

Halesia tetraptera (*The American Silver Bell Tree*), introduced to this country about the middle of the seventeenth century, is happy in moist soil, such as that found near lake and stream side. Its pendent snowdrop-like flowers appear in clusters in spring, at which time it is very pretty. It is a valuable small deciduous tree for the garden, and in autumn its winged fruit gives additional beauty. *H. hispida*, occasionally met with under the name of *Pterostyrax hispidum*, indigenous to Japan, has white flowers which appear in long racemes after those of the first named. *H. corymbosum*, formerly known as *Pterostyrax corymbosum*, also from Japan, grows about twelve feet high and has long panicles of white flowers touched with pink.

Hamamelis (*Witch Hazel*).—*H. virginica* may be planted in damp soils. It is of dense bushy growth, and in early winter bears small yellow flowers, individually not showy, but a large bush laden with blossom is attractive. The Japanese Witch Hazel (*H. arborea*), a charming hardy tree, dwarf but welcome, because it blooms

in winter; the flowers are made up of long, narrow, wavy, golden yellow petals, with a reddish-coloured calyx. We enjoy a tree in full bloom in January and February, when the brown leafless shoots are covered with golden blossom. A recently introduced species from Central China, named *mollis*, makes a valuable addition to early-flowering shrubs. It differs from the last named in being of slower growth, possessing deeper coloured flowers and larger leaves; it is very free. The Witch Hazels are deciduous and blossom while the branches are leafless. Provide a suitable background, without which much of the beauty of these delightful shrubs is destroyed. Soil consisting of loam and leaf-mould, with the addition of a few lumps of broken peat, suits them admirably; but special attention must be paid to drainage, because if water is allowed to lodge about the roots the trees soon get unhealthy.

Hedysarum multijugum is a valuable shrub of the pea family. It flowers long after the majority of shrubs and trees, and requires a sandy soil, good drainage, and sunny position. When in happy circumstances it grows four feet or five feet high, and has purplish-coloured flowers in long racemes, usually from midsummer to the middle of September, and in very fine seasons the display is continued to the early part of October.

Helianthemums (*Sun Roses*).—Dwarf-growing evergreen plants, thoroughly hardy and very useful for planting on dry sunny banks or as edgings to low-growing shrubs. They flourish best in sandy soil, and should never be planted in cold sunless positions. Good drainage is of immense importance, as Sun Roses are never a success in cold water-logged soil. *H. vulgare* and its single and double-flowered forms are very free and adapted for the rock-garden. *H. formosum*, from Portugal, has bright yellow flowers blotched with reddish-purple. It grows about three feet high and is very free.

Hibiscus.—Few thoroughly hardy-flowering shrubs are more beautiful in autumn than the forms of Hibiscus, or Shrubby Althæas as they are sometimes called. No soil seems too bad for them, and they blossom profusely in partial shade as well as in exposed situations. *H. syriacus* (Syrian Mallow) forms a round-headed bush six feet to eight feet in height, and at the end of summer bears masses of purplish flowers blotched with crimson. The under-mentioned are a few of the best varieties:—Painted Lady is very conspicuous; flowers large, delicate rose, with large red blotches at the base of each petal. *Totus albus* is a remarkably pretty and distinct pure white free-flowering variety; should be far more popular. The flowers are smaller than those of the type. *Cœlestis* is a dainty variety, with medium-sized, bright blue flowers blotched with purple. The flowers of *puniceus plenus* are semi-double, rosy-purple with a deep purple base, and those of *cærulea plena*, also double or semi-double, are mauve with a purple base.

Hippophæ rhamnoides (*Sea Buckthorn*) is one of the finest of berry-bearing shrubs for winter effect. It is very cheap and perfectly hardy. Although usually considered a seaside shrub only it can be recommended for inland planting, and if grown in masses near the edge of water the effect in winter, when the long shoots are smothered

THE BIG PANICLED HYDRANGEA (HYDRANGEA PANICULATA GRANDIFLORA).

with round brilliant orange-shaded fruits, is very striking. It is quite a success in sandy soil, and its berries remain bright for a long time. It is also an attractive foliage shrub, as its silvery-grey leaves are quite distinct. It must not be forgotten that one male plant should be planted to every group of six female ones, otherwise no fruit will be produced. Complaints are frequent of the Sea Buckthorn not fruiting, and this failure may generally be attributed to the absence of the male form.

Holbœllia latifolia, formerly known as *Stauntonia latifolia,* is a vigorous Himalayan evergreen climber, growing upwards of a dozen feet in height, and bears clusters of delightfully fragrant purplish flowers. Protection from biting winds is necessary, and rough turfy loam forms a good soil for planting it in. In spring and early summer it is much benefited by copious supplies of water, for which reason ample drainage should be provided.

Hydrangeas form a group of hardy shrubs of considerable importance, not only in the outdoor garden but under glass. One of the most useful is *H. Hortensia,* known also as *H. japonica,* and is the most frequently planted kind; it flourishes amazingly near the sea line, and it is quite hardy in a sheltered nook inland. We need hardly describe a shrub so leafy and showy when in flower. Of the many garden forms of this Chinese shrub the following are particularly meritorious:— Thomas Hogg produces great heads of white flowers, and *Lindleyi,* better known perhaps as *Japonica roseo-alba,* also deserves mention, and *stellata,* with its bright pink flowers touched with rose, is too valuable to pass by unnoticed. Iron in the soil turns the flowers to that deep, beautiful blue, so conspicuous in the autumn landscape, and as many amateurs like to turn their Hydrangeas blue, this preparation may be recommended. *H. paniculata grandiflora* is unquestionably the best of the autumn-blooming kinds, and worthy of a place in the small garden. It is a noble shrub for massing, and if planted in deep, fertile soil and the young shoots cut back close to the old wood before growth commences in spring a superb display may be expected in autumn. The thin sickly shoots should be removed altogether, and if a top dressing of manure can be given in summer additional strength will be given to the plants. The flowers are white and borne in dense panicles about a foot long and remain attractive for about two months, eventually dying off a reddish-brown colour. *H. radiata* (*H. nivea*) is an ornamental-leaved American species, with bright green leaves, the under sides being covered with white tomentum. It is grown more for its attractive leaves than for its flowers.

Hypericum (*St. John's Wort*). — Some of these are old garden favourites, well adapted for a variety of purposes, and succeed in ordinary soil. Those here mentioned comprise a few (by no means all) of the best for general planting. *H. hookerianum,* known also as *H. oblongifolium,* is the most attractive of the vigorous growing evergreen species, and towards the close of summer bears large, substantial, beautifully-shaped, deep yellow blossoms about the size of a crown piece. It is a Himalayan species of erect habit and excellent for grouping.

H. patulum is rather uncommon and very beautiful. It produces slender arching shoots, with deep green leaves and medium-sized flowers. *H. calycinum* (Rose of Sharon) is a spreading half-evergreen shrub, and succeeds under the shade and drip of trees, for which purpose we advise it be planted. It is a splendid carpet plant and delights in a cool soil. *H. moserianum*, a cross between *H. calycinum* and *H. patulum*, bears large, rich, yellow flowers of great substance. It is bushy, dwarf, very free-flowering, and the best of the later additions to the St. John's Worts. *H. androsæmum*, *H. uralum*, and *H. hircinum* are good kinds too.

Idesia polycarpa.—A remarkably handsome Japanese deciduous tree, very rare and quite hardy, but liable to get injured from cold winds in spring, unless a sheltered place can be found for it. It is of sturdy growth in deep rich naturally drained soil, and its vigorous branches, with large, bright green, heart-shaped leaves, and crimson petioles, are quite distinct from those of any other hardy tree. Its small yellowish green flowers are in pendulous racemes, and very fragrant.

Ilex Aquifolium (*The Common Prickly-leaved Holly*) and its numerous varieties are in the front rank of evergreen shrubs and small trees. As a hedge plant the Holly is unrivalled, and is used extensively in all parts of the country, as it succeeds in various kinds of soil. The winter effect of a large tree of the Common Holly standing alone in the pleasure-ground is very beautiful, either with or without its rich scarlet berries. In addition to the green-leaved forms, some have silver and golden-coloured leaves, and a few are of decidedly weeping habit, all of which may be advantageously used even in small gardens. It is a good plan to frequently transplant Hollies during the first few years of their growth to encourage the production of bushy roots. Early autumn and late spring are the best times for lifting Hollies. Propagation may be effected by seed, which should be mixed with sand immediately it is gathered and laid by in a heap until spring, the whole being turned over three or four times in the interval. Sow in drills, or in well-drained beds, just covering the seed with very fine soil. Cuttings of well-ripened shoots may be taken off in late summer, and planted in sandy soil in a cold frame. Water with a fine rose water-pot occasionally, and shade in bright weather. Budding is carried out in summer, and grafting under glass in spring, but it should not be forgotten that plants on their *own roots* are the most satisfactory. The under-mentioned list comprises some of the most attractive of green-leaved Hollies:—*Platyphylla* is vigorous, with large, glossy green leaves, and an abundance of berries. The Hedgehog Holly (*ferrox*) has curled, twisted, and prickly leaves. *Fructu* differs from the type in having yellow berries instead of red. *Hodginsi* is splendid for town gardens and avenues; its leaves are large, and the shrub berries freely. *Hendersoni* is a noble Holly, with large shining green leaves. *Ovata* is a medium-sized variety, with beautiful rich green leaves.

Of variegated Hollies—*Watereriana* (Waterer's Dwarf Golden Holly) is a charming variety, neat in growth, with smooth golden-coloured leaves; this is a grand variety for planting on the fringe

of the lawn. Another excellent golden-leaved variety is named *aurea regina*, popularly called Golden Queen; it is more vigorous than the last named, and one of the showiest of its class. Golden King is another free-growing variety, with highly coloured leaves. *Flavescens* is distinct and very beautiful; its leaves are heavily marked with yellow. *Argentea regina* (Silver Queen) is a choice Holly, and a silver counterpart of Golden Queen. *Argentea medio-picta* (Silver Milkmaid) should be represented, as it is very ornamental, with cream-white leaves, margined with green.

Weeping Hollies should include the green-leaved variety of the type; very handsome, and well adapted for planting on the outskirts of the lawn. The golden-leaved variety (*aurea*) is remarkably pretty, and quite distinct from all other trees of weeping habit. There is also a good silver-leaved weeping variety named *argentea*.

Indigofera gerardiana.—A pretty pea-shaped flower; is sufficiently hardy to plant in the garden, although the greatest flower display is produced when planted in sandy soil at the foot of a sheltered wall. Its pink flowers are in long racemes, and quite pretty in summer. The white-flowered form, named *alba*, is ornamental, but not quite so free flowering. Except in very warm counties, a south wall must be chosen for the Indigofera.

Itea virginica.—A thoroughly hardy North American shrub, four feet or five feet high, and very attractive in midsummer when carrying its long racemes of white flowers. It prefers a damp soil and partial shade. Not only are the flowers produced in profusion, but they keep fresh for a considerable time, and as they appear when few hardy shrubs are in bloom it should be carefully noted.

Jamesia americana.—A strangely neglected, dense growing deciduous shrub from the Rocky Mountains, flowers in early summer, and needs no protection even in very severe winters. Rather slow in growth, it seldom develops more than four feet or five feet high, and is quite distinct, with rather rough, oval, greyish leaves, its terminal clusters of pure white flowers being very pretty. It succeeds well in dry soil, but prefers a moist rich one and a shady position.

Kalmias.—Here we have a small group of ornamental evergreen, free-flowering American shrubs, delighting in soil favourable to the Rhododendron. Chalk or lime in the soil, or water supplied to them, is injurious. They are neat in growth, and suitable for massing; and by planting bulbs like lilies between them a rich display is obtained with little trouble in autumn as well as in spring. They are usually grown as bushes, but *K. latifolia*, the broad-leaved Mountain Laurel, makes a handsome standard—a form by no means common in gardens. Its great terminal clusters of soft rose-coloured, wax-like flowers are very pretty and lasting. The Swamp Laurel (*K. glauca*) grows about two feet, is of rather loose growth, and bears a wealth of lilac-purple clusters. *K. angustifolia*, also known as the Sheep Laurel, is quite distinct from the foregoing. The flowers are deep red, smaller than those of the *K. latifolia*, and borne with greater freedom. There are several decorative varieties of *K. angustifolia*, and all may be identified by the

varietal names—*i.e. rubra*, bright red flowers; *rosea*, rich rose-colour; and *ovata*, with ovate leaves. Kalmias are favourite shrubs for forcing. Hard forcing is not necessary, as the flowers respond to gentle heat if the atmosphere is kept moist. As the buds begin to open remove the plants to a cooler structure so as to prolong the season of flower.

Kerria japonica (*Jews' Mallow*), occasionally met with under the name of *Corchorus japonicus*, has yellow flowers, and the silver-leaved form (*foliis variegatis*), although not quite so vigorous, is very ornamental. The double Jews' Mallow (*K. j. flore pleno*) is the commonest kind, and succeeds admirably in sandy soil. It is a good shrub for planting against a wall and for grouping in the shrubbery. The bright yellow double flowers are borne abundantly. There is another very rare variety, named *major*, with remarkably fine double yellow flowers. It flowers freely and continuously.

Laburnums.—Planted with discretion the Laburnums produce delightful pictures in the garden. In spring and early summer, when the long drooping racemes of *L. vulgare*, the common kind, are at their best, few small trees are more graceful. In addition to the perfect hardihood and accommodating nature of the Laburnums, there is scarcely a soil or position in which they will not grow satisfactorily. *L. alpinum*, known also as *Cytisus alpinus* (the Scotch Laburnum), is a fine tree for decorative planting. It flowers late, and is of great value for this reason; it grows twenty feet high. The variety *autumnalis* flowers, as its name indicates, in the autumn, and *Parksii* is another excellent form, with slender racemes of flowers often a foot long. *L. Adami* (*Cytisus Adami*) is remarkable because it bears dull purple and yellow flowers on the same tree. It is a graft hybrid between *L. vulgare* and *Cytisus purpureus*, and we have seen this planted in the hedgerows. Of the varieties belonging to *L. vulgare* the undermentioned are the most distinct:—*Carlieri* has narrow racemes of flowers generally a fortnight after those of the type; *quercifolium* has deeply-cut leaves; and *foliis aureis* bright yellow foliage; while *pendulum* is of good weeping habit.

Laurus nobilis (*Sweet Bay*) should be planted beyond the influence of cold winds, and the soil most favourable to good growth is one composed of turfy loam, peat, and good leaf-soil in equal proportions. As it is considerably benefited by copious supplies of water in spring just as fresh growth appears, ample drainage should be provided to carry off superfluous water. In localities too cold for planting in the open air it is worth growing in tubs for the cool-house.

Laurustinus. See *Viburnum Tinus*.

Ledums.—These are compact evergreen shrubs, thoroughly hardy, distinct, and ornamental. They flourish in ordinary soil, but prefer one composed largely of peat. *L. latifolium* (Labrador Tree) is vigorous and free in all ways, with its great clusters of white pink-tinted flowers. The Marsh Ledum (*L. palustre*), a European species, grows about three feet high and forms a dense bush with small green aromatic leaves covered with a thick tomentum on the under sides, and in early summer its clusters of small pale pink flowers are welcome.

AN AGED LABURNUM IN FLOWER.

Leiophyllum buxifolium is a dainty little evergreen shrub introduced from the sandy plains of New Jersey upwards of 150 years ago. It is little known, exceedingly beautiful in flower, and well adapted for the rock-garden. It should always be planted in a peaty soil. The Sand Myrtle, as it is sometimes called, does not exceed one foot in height—in fact, it is not often more than six inches high; is of dense compact habit, with tiny deep green leaves, and in early summer terminal clusters of small white flowers and rose-pink buds.

Lespedeza bicolor, also known as *Desmodium penduliflorum*, an uncommon deciduous shrub of graceful habit, is hardier than is generally supposed. It is indigenous to China and Japan, and bears an abundance of reddish-purple flowers in long slender racemes. It grows upwards of six feet high, and succeeds best in peat loam and leaf-mould, and requires good drainage. In very cold localities it should be planted against a wall.

Leycesteria formosa, a fairly well-known Himalayan deciduous shrub, has pendulous racemes of white flowers touched with purple, and conspicuous purple bracts hang from the axils of the leaves in autumn. The flowers are followed by showy berries. It flourishes in ordinary soil, and is quite a success under the shade of trees. It may be planted as a cover for game.

Ligustrum (*Privet*).—No soil seems too poor or position too exposed for the ordinary forms of Ligustrum or Privet. As a hedge-plant *L. ovalifolium* (Oval-leaved Privet) is planted by the million; but care is necessary, as it has often been injudiciously used. Although the golden-leaved form, *L. o. foliis aureis*, sometimes met with as *Californicum*, is not so free in growth as the type, it is very effective when used with discretion. It dislikes full sunlight and succeeds admirably in towns. *L. sinense*, a much branched half-evergreen shrub from China, is not only welcome for its abundance of cream-white flowers, but also for its black berries, which as a rule hang upon the bushes for several months. *L. lucidum*, introduced from China more than a hundred years ago, has charming flowers. It is erect and grows about twelve feet high, and in autumn bears loose panicles of white flowers in profusion. The variety with variegated leaves, named *tricolor*, is very showy, but less vigorous than the type. *L. Quihoui*, also from China, a splendid shrub for dry soils, is of rather straggling habit, and looks best planted in groups. As it flowers so late in the season it should be planted largely in public parks and open spaces. Its flowering period is from September to the middle of October, but in mild seasons blooms on until early November. Its flowers are cream white, sweet scented, and borne in rather slender panicles. *L. japonicum* is of sturdy habit, six feet or so high, with glossy green leaves and large panicles of white flowers about the middle of July.

Liquidambar styraciflua.—The value of this rather slow-growing North American Sweet Gum-tree is not in its flowers, for they are far from showy, but in its autumn effect in the landscape, as its smooth leaves at that season of the year assume mahogany-brown, crimson, and allied colours. It is a splendid tree for small avenues, succeeding best in

rather moist deep soil, and when the position is fully exposed to the sun the autumn-tinted foliage is very handsome.

Liriodendron tulipifera (*Tulip Tree*) is a vigorous North American Tree, handsome for its broad distinct leaves, and large Tulip-like sweet-scented yellow flowers in August. In growth it is erect, and its grey bark is streaked with white. The leaves change in autumn to yellow. There are several varieties, but the one with golden leaves, named *aurea*, is the most effective. It is very showy, grows well, and its bold leaves are heavily blotched with yellow.

Loropetalum chinense.—This is a Witch Hazel-like shrub, very rare, pretty, early flowering, and of dwarf growth, with cream-white flowers composed of long slender petals. Ordinary well-drained soil suits it, and select a sunny position to enable it to thoroughly mature its wood.

Magnolias.—A large and beautiful family of shrubs and trees, valued for their bold and variously coloured fragrant blossoms. Although perfectly hardy, some of them, *i.e. M. conspicua* and *M. halleana*, flower early, for which reason protection from cold winds and sharp frosts is essential. They do not require special soil as they make good growth in the ordinary garden, provided ample drainage is secured, and the points already referred to are not forgotten. Magnolias transplant best in spring, as the roots are sparsely furnished with fibres. Give a good watering immediately after planting. *M. glauca* blossoms in summer. It is of bushy habit, eight feet to twelve feet high, with half evergreen leaves, silvery on the under sides, and with medium-sized flowers. It prefers a moist soil. *M. Campbelli*, from the Himalayas, is unfortunately not sufficiently hardy for all gardens, besides which it does not flower when young. For planting in the warmer parts of the country it can be recommended, as its large rosy-crimson flowers are very handsome. *M. macrophylla* is a vigorous tree, with large leaves, often three feet long, and immense white purple-centred flowers. It comes from the United States, and grows upwards of thirty feet high. *M. conspicua* (Yulan) is a familiar Chinese spring-flowering tree of branching habit. A tree a dozen feet or so in height is very pretty in March when laden with bold snow-white fragrant flowers. This is the kind of tree for a lawn. Of the Yulan there are several beautiful varieties, but of these only two need be mentioned here. Perhaps the finer of the two is *Soulangeana*, the flowers of which are heavily tipped and shaded with purple, the inside being flushed with pale pink. Its flowers are very lasting, and appear after those of the type. *Lennei*, with its reddish-purple flowers, is quite distinct and very free. *M. stellata*, occasionally labelled *M. halleana*, is a dainty Japanese shrub, dwarf, bushy, and free. Its sweet-scented, star-shaped flowers, with long white petals, are produced before those of any other Magnolia, and remain in good condition for several weeks. Quite small plants will bloom. The pink-flowered form (*rosea*) is similar to the species, except that the flowers are rose. *M. Watsoni* is an uncommon species, with large, sweet-scented, ivory white flowers, and a cluster of red filaments. *M. parviflora* is another rare and dwarf species also with white flowers.

M. grandiflora is the only evergreen kind that will be referred to.

THE YULAN OR LILY TREE (*MAGNOLIA CONSPICUA*)

It is a noble-looking tree, with large, polished green leaves, and in summer, bold, deliciously scented, cream-white flowers. Although usually treated as a wall shrub, it is a success planted as an isolated specimen on the lawn provided shelter from east winds is given.

Negundo. *See* Acer.

Nuttallia cerasiformis (*Osoberry*).—Grows well in hungry soils. It is a native of California, deciduous, bushy, and very free-flowering, with small white flowers produced in pendulous racemes in February and early March.

Nyssa sylvatica.—For the garden this North American tree should not be overlooked. It succeeds best in moist soil and a sunny position, when the wood becomes sturdy and well ripened. It is not conspicuous for showy flowers, its decorative value resting almost entirely upon the glorious autumn tints of the decaying foliage.

Olearias.—The Olearias form a small and pleasing group of New Zealand evergreen shrubs. With the exception of the Daisy Bush (*O. Haastii*), all require some slight protection during severe winters, that afforded by a wall being usually quite sufficient. It is a stiff bushy shrub, four feet or five feet high, with small thick leaves, and in mid-summer a profusion of white fragrant flowers. It is a good shrub for massing. *O. gunniana*, a slender species, is particularly pretty when bearing its small pure white blossoms. It is very free flowering, and succeeds better against a wall than in the shrubbery, unless a favoured spot is reserved for it.

Ozothamnus rosmarinifolius is a distinct and beautiful Australian evergreen shrub, with long slender growths, and small narrow leaves. Its small flowers are white, produced freely, and remain attractive for several weeks during summer. It should be planted in rich soil and a sunny spot.

Parrotia persica (*Iron Tree*).—A rare deciduous tree from Persia, succeeding best in a rather dry soil on a slightly raised mound facing south. It is a low-growing, much branched tree, with green Witch Hazel-like leaves turning to brilliant shades of crimson, purple, and bronze yellow in autumn. Individually the flowers of the Iron Tree are small, with crimson-tipped stamens, produced abundantly in February and March while the branches are leafless.

Paulownia imperialis is a noble tree, and under certain treatment proves a valuable addition to the sub-tropical garden. Grown naturally in the pleasure-ground, where growth is unrestricted, it makes an imposing picture, its large leaves being quite distinct. Its sweet-scented, violet-coloured flowers rarely come to perfection in these Isles, as they appear early and nearly always suffer from late frosts. It grows about forty feet high, and succeeds best in moist soil. When grown in the sub-tropical garden it should be kept to a single stem, which should be cut down close to the base in autumn, and in spring several growths will break from the old stool. Allow the best to remain and remove the others. Leaves produced on shoots treated thus are considerably larger than those on trees left to grow naturally.

Pavia. *See* Æsculus.

Pernettyas, known also as Prickly Heaths, are the showiest and most useful of small berry-bearing evergreen shrubs, and it seems strange that a group of plants so attractive, hardy, and easily grown should be so neglected in gardens. They may be grouped on the turf, and grown in pots for the greenhouse. Peaty, well-drained soil suits them best, with full exposure to the sun, and an abundance of water in spring and early summer. The varieties here mentioned are all of bushy habit, and the berries are of various sizes and colours—*alba*, blush-white; *atro-coccinea*, dark scarlet; *carnea lilacina*, pale pinkish-lilac; *rosea lilacina*, rose-lilac; *rosea major*, bright rose; *rosea purpurea*, rose and purple; *atrosanguinea*, rich crimson; *carnea*, flesh-coloured; *purpurea*, bright purple; *atro-lilacina*, dark lilac; *coccinea*, rich scarlet.

Philadelphuses (*Mock Oranges*) are white-flowered shrubs of the simplest culture. The type, *P. coronarius*, was at one time planted extensively, but of late years considerable attention has been paid to the family by the hybridist, with the result that many beautiful varieties have been grown, and the old forms planted more sparingly. The silver-leaved variety, *foliis argenteo-variegatis*, keeps its distinctive character provided it is not planted within the shade of trees or in very wet soil, and few golden-leaved shrubs of dwarf habit are more conspicuous on warm soils than a group of *P. c. foliis aureis*. It is very bushy, of free growth, and the bright yellow leaves are attractive from spring to autumn. *P. grandiflorus* bears large, pure white, very fragrant flowers in abundance. *P. gordonianus* should be planted freely as it blossoms late in the season, usually about July. It is vigorous, and its pure white flowers are not too strongly scented, which, of course, is a point worth remembering, as some people consider the fragrance of Mock Oranges overpowering. *P. microphyllus*, from Mexico, is the smallest of the group, and may be planted in the front of the shrubbery as well as in the rock-garden. It is bushy, between two feet and three feet in height, with twiggy branches, tiny leaves, and small white flowers. Of this there are several excellent varieties, the undermentioned being the best:—*Lemoinei*, the first of the set, quickly followed by *L. erectus*, Gerbe de Neige, Boule d'Argent (semi-double), Mont Blanc, and Candelabre. *Lemoinei* is as pretty as any.

Phillyrea.—All the Phillyreas mentioned are thoroughly hardy, of easy culture, and very ornamental, evergreen shrubs, suitable for planting under large trees. The Laurel-leaved (*P. decora*), known in nurseries as *P. vilmoriniana*, is conspicuous for its long, leathery, bright green leaves—the largest of all the Phillyreas. It is a fine foliage shrub, of spreading habit, and its small, white, sweet-scented flowers remind one of those of Hawthorn; they are borne in clusters in the axils of the leaves, and are succeeded by round black berries in summer. The shrub when in berry must be netted or birds will soon relieve the bushes of their burden. *P. angustifolia*, a narrow-leaved kind, grows well; and *P. media* is a shrub of pretty habit, and a success in cold situations.

Pieris.—These evergreen shrubs are ornamental, hardy, and succeed best in peaty soil and positions shielded from cold winds. *P. japonica*

PERNETTYA SHOOT WITH BERRY CLUSTERS.

(*Andromeda japonica*) blossoms early, its pure white, pendulous racemes appearing in great profusion on medium-sized plants. Of this there is an attractive variegated variety, with well-defined silver leaves. It is not so vigorous as the type, and is well worth a place in the rock-garden. The white Lily of the Valley-like flowers of *P. floribunda*, also known as *Andromeda floribunda*, appear in spring in terminal racemes. It is so easily grown that it is employed extensively for the greenhouse during winter. *P. formosa* (*Andromeda formosa*), from the Himalayas, is a glorious white-flowered shrub, but hardy only in the warmer parts of the British Isles.

Piptanthus nepalensis.—The so-called evergreen Laburnum is only a half-evergreen; it loses a great number of its trifoliate glossy green leaves every winter. North of the Trent it succeeds best against a wall, and produces in June terminal racemes of yellow pea-shaped flowers. Ordinary soil suits it so long as it is sweet and well drained and the position beyond the reach of cold winds.

Platanus acerifolia (*The Popular Plane Tree*) is undoubtedly the best of all hardy trees for planting in towns, as it makes headway in places where many other things would merely exist. The variety *Suttneri* is not quite so vigorous, but an exceptionally pretty silver-leaved Plane, *P. orientalis* (Oriental Plane) and *P. cuneata*, are good kinds too. The Plane is much planted in the streets of cities.

Polygala chamæbuxus (*The Box-leaved Milkwort*) is a neat evergreen creeping shrub, six inches high and quite at home in the rock-garden. Its fragrant creamy-white flowers are borne in short racemes in spring. *P. c. purpurea* is an excellent companion to the type, from which it differs by reason of its reddish-purple flowers.

Pterocarya caucasica (*The Caucasian Walnut*) is a beautiful deciduous tree of dense branching habit, with long leaves composed of numerous deep green leaflets. Planted in moist soil it usually grows between twenty feet and thirty feet high.

Prunus.—There are in this family some of the most charming of hardy spring-flowering trees and shrubs. The genus Prunus, according to the latest botanical classification, includes the Almonds, Peaches, Apricots, Cherries, and Plums. Here is a wealth of material for the amateur gardener, and as some of them blossom at a season when flowers out of doors are very scarce and welcome, they should be used freely. Remember that those mentioned here are deciduous, and the flowers appear while the trees are leafless, for which reason discretion should be used at planting time to see that they are in association with suitable evergreens so as to bring out their full beauty. Protection from cutting winds is essential. *P. amygdalus* (the common Almond) is happy in suburban gardens and flourishes in town squares. It is a much-branched tree, and in early March known by its delicate pink blossoms. Of this there are several beautiful varieties, amongst which are *Amara* (Bitter Almond), flowers white, flushed with rose; *dulcis* (Sweet Almond), flowers before the last named; *flore pleno*, flowers double, rose-pink; *macrocarpa*, flowers very large, pale pink; *persicoides*, flowers, rose-pink, borne early. *P. nana* is a delightful little shrub for the shrubbery border

in early spring. It is very bushy, rarely ever more than four feet in height, and in February and March smothered with rose-coloured bloom. *P. persica* (the Peach Tree) is too familiar to describe; but its double-flowered varieties, *alba* and *rosea*, are deserving of extended culture. *P. davidiana alba* is a remarkably pretty pure white-flowered Peach, and the first of the group to flower. It is of upright growth, and is so white that one is reminded of a snowdrift when it is in flower. *P. Simoni* also bears pure white flowers in great profusion about the middle of February.

The purple-leaved Plum, *P. cerasifera atropurpurea*, better known as *P. Pissardi*, gives colour to the shrubbery with its deep purple leaves. It grows freely and bears blush-coloured flowers. *P. divaricata* is a favourite tree for the lawn; it is of graceful outline, and bears small pure white flowers in the early part of the year. For clothing walls of medium height *P. triloba*, from China, can be well recommended. It is perfectly hardy and free in every way; in fact, so thick are the flowers in March and April that the shoots upon which they are borne are completely wreathed. Their colour is rose passing to delicate pink. Although recommended for wall culture it does not need protection; but when grown thus the flowers are more protected than in the open shrubbery. *P. Pennsylvanica* is exceedingly graceful, and in May carries clusters of small white flowers. *P. chamæcerasus*, a European species, is rarely seen in gardens, notwithstanding its undoubted beauty. It is of elegant habit and quite distinct; flowers white.

The double white-flowered form of the Gean (*P. Avium*) is one of the loveliest of vigorous ornamental Cherries, the pure white flowers hanging in great clusters, and lasting long in beauty. *P. japonica flore pleno*, known also as *P. sinensis flore pleno*, is a neat shrub, conspicuous for its abundance of small perfectly double white flowers. An excellent shrub for flowering under glass in winter. *P. pseudo-cerasus* is perfectly hardy, and has rose flowers in profusion. Of this the variety James H. Veitch is particularly useful, as it flowers later than the type, and on this account should be planted to prolong the season. The large flowers are considerably deeper in colour than those of the last named, and carried in drooping clusters, the leaves of a pleasing bronze-green. *P. serrulata*, sometimes called *Cerasus Sieboldi*, has double white flowers, touched with rose-pink. The tree is of spreading habit, and very free. *P. Mahaleb* (the Mahaleb Cherry) is a lovely small white-flowered Cherry for the lawn. It is thoroughly hardy, and of elegant growth. *P. Padus* (the European Bird Cherry) is a pretty tree at flowering time. Its racemes of white flowers load the woodland with an almost unpleasantly strong odour; it is very strong, and grows to a considerable height.

Pyrus.—Few groups of hardy shrubs and small trees are more beautiful in flower and fruit than the different forms of Pyrus. Beyond protection from cold winds, they need no special soil or culture. *P. japonica* (the Japanese Quince), better known, perhaps, in gardens as *Cydonia japonica*, is an old-fashioned garden shrub. It grows into a large bush, and its long, strong shoots are pretty in early spring. The flowers are scarlet, almost crimson, and appear in advance of the leaves. In addi-

PYRUS SPECTABILIS ON THE LAWN.

tion to its value for the shrubbery, it may be (and is in some places) planted against a wall corner. Of this accommodating shrub there are several excellent varieties, differing in the size and colour of the flowers. For instance, one bears the name of *cardinalis*, and has larger, brighter, and more substantial flowers; while the colour of those of *rosea* is indicated by the name; *nivalis* is blush-white; *P. Maulei*, from Japan, is a slender shrub, with flowers not so large as those of *P. japonica*, and distinctly shaded with orange; *P. baccata* (*Malus baccata*), the Siberian Crab, is not only a flowering tree of rare beauty, but in autumn is bright with richly coloured fruits. Of this there are several beautiful varieties with variously coloured fruits. This is a Crab for every lawn, large and small.

P. floribunda, a native of Japan, is one of the prettiest of the family for the garden. Its long branches are smothered in spring with pink flowers and unopened rose-coloured buds. The fruit is small, showy, and abundant. The semi-double flowered variety *flore pleno*, also met with occasionally as *Parkmanni*, has rose-pink flowers. *Atrosanguinea* is deeper in colour, and very charming. *P. Malus* is well known in gardens, and its varieties, *coccinea*, *rosea*, *nervosa*, and *pendula*, are grand for decorative planting. *P. prunifolia* is a vigorous tree, with large pink flowers, and scarlet fruits in autumn. Of the last named there are varieties with red, crimson, yellow, orange, and green fruits. *P. Sikkimensis* should be planted freely for the sake of its dainty white and pink flowers. It is of excellent habit, and by no means common. The same remark also applies to *P. Scheideckeri*, one of the loveliest of spring-flowering trees. The flowers are large and rich pink. The double-flowered form of *P. coronaria*, the sweet-scented Crab from North America, is a very choice tree, with large, long-lasting, pale-pink or rose-coloured flowers. *P. Ringo* (*Malus Ringo*) is a dwarf, bright, spring-flowering tree. It is freely branched, of slow growth, and with pink flowers. *P. spectabilis*, another kind of great value, forms a round-headed tree with long branches, and in spring has clusters of rich pink semi-double flowers. *P. aucuparia* (Mountain Ash) and its varieties are splendid trees for autumn effect. The type bears a profusion of white flowers, generally in April and May, and handsome clusters of richly-coloured berries in autumn. The variety *fructu luteo* has yellow berries, and as they almost weigh down the branches, one may imagine the effect of a good specimen. *P. Aria* (White Beam) is a European tree, with white flowers in May, and orange-scarlet berries in autumn and winter. The varieties *sulphurea*, *græca*, and *lutescens* are worth notice. *P. vestita* (Nepaul White Beam) is one of the most handsome of White Beams. The large leaves are covered with a white woolly-like substance.

Quercus (*Oaks*).—The Oaks are familiar garden trees. The autumn effect of such kinds as *Q. coccinea* (the American Scarlet Oak) is magnificent. Its foliage in September and October turns to crimson and scarlet. Another Oak with gorgeous coloured foliage in autumn is the Red Oak (*Q. rubra*), with large handsome leaves. *Q. conferta*, known also as *Q. pannonica*, is distinct. In spring its leaves are bright green,

and in autumn change to shades of brown and yellow. *Q. castanæfolia* is a remarkably fine kind, with large polished green leaves. Of the Turkey Oaks (*Q. cerris*), one named *variegata* should be grown in preference to any other silver-leaved variety. It has silvery-grey leaves. Amongst the golden-leaved Oaks, *Q. pedunculata concordia* is the best of its class. The leaves do not burn in the sun, and the colour is maintained until autumn. Of the English Oak (*Q. pedunculata*) there are several varieties of much beauty, that named *purpurascens*, or *atropurpurea*, is very showy, and of free growth. *Q. filicifolia* has deeply cut leaves. *Q. laurifolia*, with its large leaves, creates a pretty effect in autumn when its foliage is tinged with yellow and deep red.

There are many evergreen Oaks, but the following may be taken as representing a few of the best for general effect. *Q. Ilex* (the Holm Oak) is the most frequently planted. It forms a large dense head with long spreading branches. There are several distinct varieties, all of which are better for being often transplanted in a young state, as the roots are not furnished with many fibres. The Cork Oak (*Q. Suber*) merits attention for its very rough bark and neat habit. It is quite a small tree. *Q. ballota* (Sweet Oak) is slow in growth, and has rough greyish bark. *Q. cuspidata* and *Q. c. variegata*, are ornamental, and quite hardy.

Rhapiolepis japonica is a sturdy growing evergreen shrub for a wall in localities where it is likely to suffer in the ordinary shrubbery in severe winters. It is rather slow in growth, and the deep green leathery leaves are set off in spring by terminal clusters of white sweet-scented flowers, these being succeeded by round black berries. For forcing into bloom for the greenhouse in early spring, this rather uncommon Japanese shrub can be recommended. It flourishes in ordinary soil, and dislikes stagnant water near its roots.

Rhododendrons.—Formerly Rhododendrons and Azaleas were kept distinct, but they are now botanically classed under one heading. No group of hardy shrubs is more varied in colour or more attractive at flowering time than these, and as they succeed in nearly all well drained soils which do not contain lime or chalk, there seems little reason why the better kinds should not enter more largely into the decoration of public parks and gardens. We like to see these shrubs in groups or masses with a suitable background for the delicately tinted flowers, and beyond the reach of cold winds, as the flowers of some, especially the deciduous kinds, appear early, and are apt to suffer from late frosts. The shrubs receive much benefit from a yearly top dressing of leaf-mould, and while growth is in progress water should be supplied freely. The deciduous sorts prefer partial shade to full sunlight. Rhododendrons are easily propagated by seed, cuttings, layering, and grafting. As the seed is very fine, be careful not to cover it too deeply, or the seedling will be unable to make its way through the surface soil. It should be barely covered with soil passed through a fine mesh sieve. For small quantities shallow pans or boxes, placed under glass, are convenient, but where plants are required in great numbers, slightly raised beds out of doors should be resorted to. Shade the beds with Spruce or Fir boughs. It seems strange that plants are not more frequently raised from cuttings. True,

they take longer to reach planting size than grafted ones, but there is no trouble in looking after suckers, as is the case with grafted plants. Cuttings of the young ripened wood emit roots plunged in a warm close case in sandy soil. Layering is another means of increasing the stock. Select nice well-ripened shoots, and peg them into the soil, which should be kept moist. Grafting is resorted to principally in the case of hybrids.

Attention is first directed to a few of the best of the deciduous kinds:—*R. arborescens*, an American species, flowers rather later than most of its congeners. Its reddish sweet-scented flowers are borne freely. *R. viscosum* (Clammy Honeysuckle) merits attention on account of the freedom with which its white-scented flowers are borne. *R. occidentale*, the Western Azalea, produces a wealth of white sweet-scented flowers, the base of the upper segments being blotched with yellow. It flowers late in the season, and its autumn-tinted foliage is very bright. *R. Schlippenbachii*, an uncommon species from China, has large delicate pink flowers spotted with crimson. It is quite hardy, of excellent growth, and grand for massing. *R. calendulacea* grows about six feet high when suitably placed. It flowers freely, and is orange-red in colour. *R. rhombicum*, from Japan, is a valuable shrub, and quite hardy. Its rosy-purple flowers appear early, and are welcome because few other shrubs are in flower at the same time. *R. Vaseyi* is another free-flowering kind from America. Its delicate white and pink flowers are carried in loose clusters. *R. dauricum* belongs to the very early-flowering section. It is of rather straggling habit, three feet high, and bears purplish-coloured flowers in abundance. *R. flavum*, better known as *R. pontica*, is a showy plant in spring. Its large flowers are borne in clusters, and the colour is yellow or orange, and *R. sinensis* is another attractive kind. The gorgeous coloured hardy hybrids and varieties have originated principally through the crossing and intercrossing of such species as *R. calendulacea*, *nudiflorum*, *occidentalis*, *viscosum*, *flavum*, *sinensis*, &c., the progeny, of course, being worked again in the same way.

Species with evergreen leaves: *R. Fortunei* is a precious Chinese shrub with large sweet-scented flowers in great clusters, ground colour white, with a delicate suspicion of pink throughout. It is hardy and very uncommon. *R. Smirnowi* is another uncommon species, perfectly hardy and very showy. It forms a sturdy bush, and carries lilac-coloured flowers with wavy margins in compact trusses. *R. niveum*, a Himalayan species, deserves a sheltered place in the garden for its bold leaves, which in shape resemble those of a laurel, the under sides being covered with a white woolly substance. The flowers are soft lilac, blotched with rosy-lilac. *R. Thomsoni* and *R. campanulatum*, also Himalayan species, grow freely and flower well in the neighbourhood of London. Both make an even growth, the first named bearing clusters of rich crimson flowers, and *R. campanulatum* neat trusses of lilac-coloured blossoms spotted with purple on the upper segments. *R. glaucum* is dwarf and very beautiful, flowers light purple. *R. campylocarpum* is a dainty dwarf species with delicate yellow flowers.

Kinds suitable for the rock-garden: Few dwarf-growing Rhododendrons are more delightful than *R. racemosum*, from Central China. It is a gem for the rock-garden as well as for edgings to beds planted with low-growing shrubs. The small pale pink flowers are in terminal clusters, and appear in early spring. It is a splendid addition to shrubs suitable for forcing into bloom for the conservatory. *R. hirsutum*, from Southern Europe, and its white-flowered variety, are distinct and pretty. *R. ferrugineum* (Alpine Rose) is a dainty compact species with an abundance of pink flowers in terminal clusters.

A few choice hybrids and varieties: A beginner does not require many kinds, and these are:—*Kewense* grows vigorously, and bears large loose trusses of the most delicate pink flowers imaginable. Pink Pearl is another recently-introduced kind and certainly one of the most meritorious. It is exceptionally free and has large substantial pink flowers in huge trusses. *Præcox* is particularly welcome in early spring. It is dwarf, neat, and its rose-coloured flowers are produced in great profusion in February and March, but it is rather tender. Early Gem flowers about the same time. Its rosy-lilac flowers are distinct and beautiful. These last two named kinds are splendid for greenhouse decoration in winter, and Cunningham's White is a charming variety for the same purpose; flowers white with a few dark spots. *Manglesii* is hardy in the neighbourhood of London. Its large white flowers with brown spots are borne in immense trusses.

Fortunei Hybrids.—These are hardy, of free growth, and remarkably pretty. The flowers of each of the varieties mentioned below resemble those of the parent in shape—*R. Fortunei*, one of the most exquisite of hardy species—and the colours are of different shades of pink and rose. Duke of York, Mrs. W. T. Thiselton Dyer, Luscombei, and Profusion, are a few of the best.

The hardy Azaleas or Rhododendrons, as they are called, should be planted in all gardens of sufficient size. In spring the tier-like growth is smothered with flowers, of spicy fragrance, and in autumn the leaves turn to resplendent colours. The bush spreads out, and in time covers much ground. Owing to their early flowering give shelter from east and north-east winds; they are not tender in themselves, but late frosts hurt the flowers. Mr. Anthony Waterer, of Knaphill, Woking, has raised a glorious series, the colours of wonderful richness and variety—white, crimson, scarlet, orange, yellow, pink, buff—and this new race is in every way an advance upon the older forms. It is important to group Rhododendrons carefully so as to avoid unpleasant colour contrasts. It is very easy to go wrong, as, for instance, a flower that among shades of rosy amaranth may look a pure pink, if removed from their neighbourhood and put beside a pure pink, that is seen among white or scarlet rose, will be found to be quite out of harmony. This width of colour-range will also enable the buyer to choose the combination that best pleases his eye—whether of clear pink with white and rosy scarlet, of the few shades that incline to salmon-rose, of the strong and very numerous amaranths, or the cool purples which go best with the clear whites and whites tinged with purple. It should be remembered that it is always

A RHODODENDRON DELL.

well to keep the true purples away from other colours. They are beautiful by themselves or with whites, and look best in half-shady places.

Rhodotypus kerrioides is a much neglected Japanese shrub, easily grown, and very pretty in May, with its pure white flowers two inches across. It is thoroughly hardy, five feet or six feet high, deciduous, and repays for good culture.

Rhus (*Sumachs*).—The Sumachs form a useful group of deciduous trees and shrubs for the garden, and range from shrubs a few feet high to quite small trees, and succeed in ordinary soil. The exquisite leaf colours of autumn are quite a feature, and few shrubs of similar growth are more effective at that season of the year. Propagation may be carried on by cuttings and layers, and also by pieces of the fleshy roots, cut into short lengths, planted in soil and placed in a warm temperature to assist vegetation.

R. Cotinus (Venetian Sumach, or Smoke Plant) is a shrub six feet or so in height, of spreading habit, with smooth, glaucous leaves, and as autumn approaches the colour changes to exquisite shades of crimson and purple. Its curious and conspicuous inflorescence, with few really properly developed flowers, is followed by feathery seed plumes which create a pleasing and uncommon effect in early autumn. It must not be cramped for room, and if it can be planted in a sunny spot so much the better, as the autumn foliage is considerably improved by exposure to the sun. *R. cotinoides* (Chittam Wood) is in its autumn dress brighter than the Venetian Sumach; in fact, it has the showiest of autumn leaf colouring. *R. typhina*, popularly called Stag's Horn Sumach, is handsome; quite different in growth to either of the last named. It forms a tree of small stature with stout branches, and large deep green leaves which change before they fall to brilliant shades of reddish-purple and orange. It succeeds well in town gardens, is attractive on the lawn, and when grown on the single-rod system and cut back hard every year, may be used in the sub-tropical garden. Another Rhus conspicuous for its gorgeous leaf-colours in the autumn is the Poison Ivy (*R. Toxicodendron*). On no account should it be planted in positions frequented by children, as the shoots when broken emit poisonous sap. The fern-leaved variety of *R. glabra*, called *laciniata*, is more graceful, but it is unfortunately a trifle tender, for which reason a sheltered nook beyond the reach of biting wind is necessary. In such positions it grows freely and forms a handsome specimen. A lovely plant for the sub-tropical garden, and its foliage is unusually showy in autumn.

Ribes (*Flowering Currants*) flourish in very poor soil and cold situations. The flowers are of many colours. The type, *R. sanguineum*, hails from North America, and bears red flowers in pendulous racemes. Of this there are several excellent varieties, the following being perhaps the best:—*Atrosanguineum*, with its large richly coloured flowers, lasts a long time in good condition; *carneum* produces rose-coloured flowers, and those of *albidum* are white or nearly so. *R. aureum* is conspicuous for its drooping racemes of yellow flowers, and in autumn its richly coloured leaves are distinct and showy. The variety *præcox* is a border shrub, and even more valuable than the last named, as it flowers very

early. The small, red, Fuchsia-like flowers of *R. speciosum*, formerly called *R. fuchsioides*, are produced very freely, and have long projecting stamens. Although perfectly hardy it is better for a wall, as its tiny flowers are then seen to advantage; the slender shoots are spiny. *R. gordonianum*, raised between *R. aureum* and *R. sanguineum*, is vigorous and very free.

Robinias (*Hardy Acacias*).—These are trees of much interest, quite hardy, and free-flowering. Of the Common Locust Tree (*R. pseudacacia*) there are several good varieties. *Decaisneana* is of free growth, and produces light pink flowers; *Bessoniana* is a thornless variety, and an excellent tree for town gardens. It forms a dense head, and its bright green leaves hang long after those of other kinds have dropped; *crispa* has distinctly curled leaves; and *aurea* is a bright yellow foliaged variety; while *semperflorens* flowers nearly the whole summer through. *R. hispida*, the lovely North American Rose Acacia, is the most ornamental of the genus, and it is very beautiful towards midsummer, when bearing its drooping racemes of rose-pink flowers. For villa-gardens, or where space is restricted, this should not be lost sight of. Select a sheltered spot for this Acacia, as the branches are rather brittle, and in rough weather are apt to snap off. The variety named *inermis* is very fine too. It is free in growth, with large leaves and delicately-coloured flowers. *R. neo-mexicana* flowers in autumn, at which time it is very distinct. Its rose-coloured blossoms are in dense racemes.

Romneya Coulteri (*Californian Bush Poppy*).—Every gardener almost tries to grow this beautiful shrubby plant, which has big, flimsy, fluttering flowers of snowy white, with a centre of golden stamens. The flowers are frequently over six inches across, and a strong plant will bear many expanded at one time. It is not very hardy, but is frequently quite happy in many gardens in the south of England. In the north it should be grown indoors, and is well worthy of glass protection. A warm, sheltered wall is a suitable place for it. Captain Coleridge, a good gardener at Twyford, in Berkshire, says: "I leave the old growth as a protection during the winter, but as soon as the new shoots appear at the base the old wood is cut down to the ground like any other herbaceous plant." Writing in the summer of 1899, Captain Coleridge says that his largest plant had thirty-seven expanded blooms besides numerous buds at one time. "When I planted it eight years ago it was a very small plant. It was put in a warm corner facing south-west, and it now covers ten feet of ground and is five feet high. It has no protection, and blooms freely every year."

Rubus.—Although the Bramble family is very large, it does not contain many really beautiful species. *R. odoratus*, the North American purple-flowered Raspberry, grows freely, and during the late summer bears fragrant flowers in terminal corymbs. *R. deliciosus* (the spineless Rocky Mountain Bramble) forms a good bush, and its white flowers are two inches or more across, with a central cluster of golden-yellow stamens. This is effective in bold groups. Fertile soil and a warm position should be chosen for this uncommon shrub. *R. biflorus*, a

free-growing, white-stemmed species, is effective in winter after its leaves have dropped. *R. rosæfolius coronarius*, or, to be quite correct, *R. thyrsoideus flore pleno*, with its semi-double, pale pink flowers, should be planted for the freedom with which they are borne and the long time they remain attractive. For planting out of doors in southern counties the Japanese Bramble (*R. phœnicolasius*) is a success. It is vigorous, with pink flowers carried in long racemes, followed in autumn by scarlet berries. This is called the Japanese Wineberry, too, and is a picturesque spreading shrub; its fruits are liked by some for dessert and preserve.

Sambucus (*Elder*).—All the Elders succeed well in gravelly soil; they also make good growth in moist land. The type, *S. nigra*, need not be referred to here, but a few of its varieties are worthy of consideration. In the first place, the parsley-leaved variety, *laciniata*, is a handsome cut-leaved Elder, and *foliis aureis* (Golden Elder) has richly coloured foliage, especially if the soil is inclined to be dry and the position a sunny one. The silver-leaved form makes a good companion to it, as it grows freely, and the silvered leaves are quite distinct. *S. racemosus*, a European species, is conspicuous for its great profusion of glowing scarlet berries. It prefers damp soil. We care little, however, for the Elders, and the golden-leaved kind is not always of good colour. All are hungry-rooting trees. Never put them near a mixed border.

Skimmias.—These are good evergreen shrubs either when in flower in spring or laden with their bright scarlet berries in autumn. They are quite hardy, neat in growth, with large panicles of fragrant white flowers. Plant in rich deep soil, and avoid cold bleak situations. In cold counties it is safer to grow them in pots or plant out in cool houses in light airy positions. *S. japonica* and *S. Fortunei* are the sorts most frequently seen in gardens, but *S. Foremani* is particularly valuable, as its large round scarlet berries hang upon the bushes for at least twelve months.

Sophora japonica is an attractive, deciduous tree, with sulphur-coloured, pea-shaped flowers in terminal panicles towards the close of summer. It is graceful in growth, and should be planted in all gardens where a suitable position can be found for it.

Spartium junceum (*Spanish Broom*) has been grown in this country since about the middle of the fifteenth century. It grows to a height of about ten feet, and is a shrub for planting in dry soil. Racemes of fragrant pea-shaped flowers are borne along the slender, almost leafless, branches in late summer. For planting in masses on sandy banks few shrubs are more effective at flowering time.

Spiræas.—Amongst hardy deciduous shrubs of dwarf growth, few offer such a pleasing variety of flower colour as the Spiræas, which are reasonable in price, of simple culture, and sufficiently hardy to stand severe winters. Plant in fairly rich moist soil, and a position shielded from the fierce midday sun is preferable to full exposure. Propagation is readily effected by cuttings of the young wood taken off in August, planted in sandy soil, and placed in a warm, close case for a fortnight

or so. *S. hypericifolia*, from Asia Minor, is a dainty species with white flowers. Its long, slender shoots and small white flowers create a pretty effect in May. *S. discolor* (*ariæfolia*), a well-known border shrub, produces lavishly its cream-white flowers, in long, graceful panicles, about midsummer. In order to see the full beauty of this shrub, plant it in an open spot, where it is not cramped for space, as in many shrub borders. *S. media*, better known under its garden name of *S. confusa*, has quantities of white flowers in corymbs all over the plant. It is a twiggy shrub, and largely used for forcing. *S. prunifolia flore pleno*, the double-flowered, plum-leaved Spiræa, is a precious spring flowering kind, but, unfortunately, not much grown. Its small, white flowers appear in abundance. *S. Douglasi*, from North America, is fairly well known. It has terminal panicles of rosy-red flowers in July. *S. Thunbergii*, a Japanese species, grows about three feet or four feet high, and in early March, sometimes even in February, its clusters of fragrant white flowers are welcome. Its autumn-tinted foliage is very pleasing. Space should be reserved in the rock-garden for *S. bullata*, known also as *S. crispifolia*, an uncommon Japanese species, much too dwarf and slow in growth for the ordinary shrubbery. Its leaves are small, deep green, and its rose-coloured flowers appear in dense corymbs. *S. japonica* Anthony Waterer is a delightful late-flowering Spiræa. It is dwarf, bushy, and its rich crimson flowers remain showy for a long time. Few shrubs are more appropriate for massing. *S. j. glabrata* is rare, and very beautiful; flowers pink, borne in large corymbs. *S. arguta* is the most charming of white-flowered Spiræas. It is perfectly hardy, and its small snow-white blossoms are very lasting. *S. Van Houttei*, raised from *S. media* and *S. triloba*, also bears white flowers in great abundance. *S. lindleyana*, a magnificent species from the Himalayas, bears terminal panicles of white flowers late in the season. When suitably placed, it grows nine feet high, and is well worth a place in the garden as a foliage shrub alone, its graceful pinnate leaves being of a refreshing shade of green.

The **Staphylleas** (*Bladder Nuts*) are pretty, spring-flowering, deciduous shrubs, six feet or more high, and thoroughly hardy. Ordinary, well-drained soil suits them perfectly, and if frequent doses of water can be given while growth is young much benefit ensues. *S. colchica*, from the Caucasus, is finer than the European species, *S. pinnata*, and when bearing its pendulous racemes of white flowers, it is remarkably effective.

Stuartias.—The Stuartias are not happy in every garden. They are rather tender, perhaps, and greatly dislike east and north winds, especially in spring. A rich, loamy soil, to which has been added leaf-mould and peat, favours the best growth. Anything like stagnant water about the roots is fatal. *S. virginica*, from North America, is perhaps the best known. Its cream-white flowers, between two inches and three inches across, are white, with prominent brownish-red stamens. *S. pseudo-camellia*, a Japanese species, is exceedingly attractive when displaying its bold, snow-white flowers with yellow stamens. The autumn-tinted foliage is distinct and showy.

Styrax japonicum produces a wealth of snow-white, sweet-scented, drooping, bell-shaped flowers, relieved by yellow stamens. It is quite hardy, and suitable for planting on the fringe of the lawn. It is a much-branched, rather loose shrub, requiring a rich, well-drained soil and sunny position to insure a thorough ripening of the wood, without which a full flower display cannot be expected.

Symphoricarpus racemosus (*Snowberry*).—This deciduous North American shrub, usually four feet or five feet high, is not conspicuous for showy flowers, its decorative value depending upon its round white berries, which remain upon the branches long after the leaves have fallen. It is of the simplest culture, and quite a success under the shade of trees.

Syringas (*Lilacs*).—As a garden shrub the Lilac is familiar, few things being more easily grown, or more effective at flowering time. With the exception of *S. persica*, all those here mentioned have been raised principally from *S. vulgaris*, the common Lilac. *S. persica* is a neat-growing species of slender habit, and bears a profusion of small lilac-coloured flowers. Of garden varieties the following is a good selection:—Double-flowered sorts: Michael Buchner, large truss, delicate lavender, edged with pale rose; Virginité, blush pink; *Mme. Lemoine, cream white passing to pure white, large and substantial; Mme. Jules Finger, pale rose, large, and very fragrant; La Tour d'Auvergne, violet purple, sweet scented; Alphonse Lavallée, pale blue, touched with violet. Single-flowered sorts:—*Alba grandiflora, large pure white flowers, borne in handsome trusses; Marie Legray, another excellent white-flowered kind not quite so vigorous in growth as the last named; *Souvenir de L. Spath, purple; Charles X., rosy purple. President Grèvy, Louis Van Houtte, and Princess Marie are good sorts, too. Those marked with an asterisk should be chosen first.

Tamarix can be thoroughly recommended for the sea-coast. They are of free growth in sandy soil, and bear slender spikes of small flowers in great abundance towards early autumn. *T. gallica* is very feathery and graceful. In favourable positions it grows at least a dozen feet high, and the flowers appear like veils of misty pink. *T. hispida* is delightfully free, distinct, and of sturdy growth.

Tecoma grandiflora, sometimes met with as *Bignonia grandiflora*, a native of China and Japan, deserves generous treatment, as its flowers are very handsome, appear in great terminal clusters, and the colour is rich orange red. In very cold localities it needs the protection of a wall. *T. radicans* (*Bignonia radicans*) is better known than the first named, and a much older inhabitant of our gardens. It is a midsummer flowering climber, vigorous, quite distinct, and highly attractive. It is serviceable for training against walls, up old trees, pergolas, &c., and the tubular-shaped orange-red flowers are borne in great profusion.

Tilia.—The Limes are noble trees. All are perfectly hardy, and delight in moist rich soil, and a position screened from cold winds. The Common Lime is an excellent avenue tree, and bears quantities of delightfully fragrant yellowish-white flowers. The Silver-leaved Lime is vigorous, and exceedingly ornamental. Its bold bright green leaves are covered with white tomentum on the under sides.

Ulex (*Gorse, Furze, or Whin*).—The type is a native shrub and well known, but the double-flowered variety is less frequently planted. Its double yellow flowers are very bright, and remain a long time in fresh condition. *U. nanus* is welcome, as its flowers appear in early autumn, and a succession of blossom is maintained until December. It grows about fifteen inches high. Furze plants dislike much interference at the roots. They succeed in poor soils and exposed situations, and are readily propagated by cuttings planted in sandy soil on a shady border, or by seed. Strong seedlings are very reasonable in price. No shrub is more suitable for clothing rough banks. The

New Zealand Veronicas are neat shrubs, with evergreen leaves and spikes of variously coloured flowers. Although not sufficiently hardy for general planting throughout the British Isles, they may be placed in a sheltered nook in the garden, especially in the south and west of England. Avoid planting in positions exposed to the east, as cold winds are harmful. The soil should be rich, not too moist, and thoroughly well drained, as sour soil is most injurious to them. *V. Andersoni variegata* is very handsome, with silver leaves. It is used largely in the flower-garden, and for growing in pots for winter decoration few shrubs are more attractive, or more easily grown. *V. Traversi* is a neat-growing species, with deep green leaves, and in late summer bears spikes of pale blue or white flowers. It grows four or five feet high, and succeeds admirably near the sea-line. *V. speciosa* bears long racemes of rich purplish-blue flowers. It is of good growth. The garden varieties, Silver Star, Blue Gem, and Purple Queen are very attractive.

Viburnums (*Guelder Rose*).—These are quite hardy shrubs and very free, especially such kinds as *V. Opulus sterile*, *V. plicatum*, and *V. macrocephalum*. Deep loamy, well-drained soil suits them best, and to encourage a thorough ripening of the wood a sunny position should be selected. They are familiar border shrubs and admirably adapted for blooming in winter under glass. *V. Opulus*, the native Guelder Rose, is a valuable berry-bearing shrub. In October the leaves change to lovely shades of crimson and orange. The variety *sterile* is perhaps the most familiar Snowball Tree, very ornamental, of easy culture and good habit. Its round heads of flowers are borne in great abundance and remain attractive for a long time. *V. plicatum* (Japanese Snowball Tree), so far as purity of flower is concerned, is superior to the last named, but the plant is not nearly so graceful in habit. It blossoms usually in June, and its snow-white flower clusters are produced at the points of the small twigs along the shoots. It may be used with excellent effect as a wall covering, and for flowering under glass during winter it can be well recommended. It is a grand shrub for massing. *V. macrocephalum*, an uncommon kind, is a native of China and deserves wall protection, as it is a trifle tender and too valuable to pass by unnoticed. Its large heads of white flowers are very beautiful, and a good-sized, well-grown plant at flowering time is strikingly handsome. It is an admirable shrub for greenhouse decoration during early spring. *V. acerifolium*, an old inhabitant of our gardens, bears an abundance of white flowers in spring and richly coloured berries in autumn, at which time its tinted

GROUP OF THE CHINESE GUELDER ROSE (VIBURNUM PLICATUM).

foliage is very bright and distinct. It seldom grows more than five feet or six feet high. The well-known Laurustinus (*V. Tinus*) is an evergreen shrub of bushy habit, with small pleasing green leaves; and in winter, when bearing its wealth of pinkish-white flowers, is welcome in the border. Plants lifted in autumn and put into pots flower naturally towards Christmas, on which account they are most useful for the greenhouse. The variety *lucidum*, which bears large clusters of pure white flowers, and *purpureum*, with its dark leaves, are worthy of mention. The wild Guelder Rose or Water Elder (*V. Opulus*) is one of the most beautiful of all shrubs, native or otherwise. Though the Guelder Rose is more showy than the Water Elder when it is in flower, it lacks the autumn beauty of the wild plant when it is loaded with the bunches of brilliant red berries. The native plant grows by the sides of streams and ditches in a strong alluvial soil, where it is often a shrub of rather rank growth and straggling habit; transplanted into drier garden ground it becomes a neater bush, and most seasons its wealth of berry makes it one of the best things in the September garden. It is a bush to plant by the lake side. The leaf begins to colour at the same time as the berry, and by the end of the month is a glory of rich crimson.

Vincas.—The Periwinkles are trailing evergreen shrubs, and succeed in dry as well as in moist soil. For planting under the shade and drip of large trees they are used largely with considerable success. They can also be relied upon for clothing sandy banks and rooteries. *V. major* spreads quickly, its polished green leaves are pretty, and in May and June its rich blue flowers are borne freely. Of this there is a variegated form with showy leaves, and quite as hardy as the type. The small-leaved Periwinkle (*V. minor* and its varieties) are not so vigorous as either of the last-named; they are, however, attractive, neat-growing trailers. Propagation may be carried on by division or by cuttings.

Xanthoceras sorbifolia is a Chinese shrub with deciduous pinnate, bright-green leaves; it grows about fifteen feet high when suitably placed. Its cream-white flowers, stained with red in the centre, appear in profusion in racemes just as the leaves are beginning to unfold. A sheltered position and fairly rich soil encourage the best growths. In cold localities it should be grown against a wall.

Yuccas.—These are amongst the most handsome of ornamental evergreen hardy shrubs for general outdoor planting. They are quite at home in the shrubbery border, and add colour and effect to the flower-garden, and for planting on the outskirts of the lawn, as well as for sunny banks and the rock-garden, few evergreen things create more beautiful effects. For winter bedding, too, they are a success. They do not require special culture, ordinary well-drained soil suiting them admirably. They are not, however, partial to wind-swept positions. *Y. gloriosa* (Adam's Needle) is of strong growth, hardy, with broad, long, sharply-pointed stiff leaves and whitish bell-shaped flowers, borne on large stout spikes. *Y. recurvifolia*, sometimes met with as *Y. pendula*, is of distinct habit. It is free in growth, with broad deep green arching leaves; an excellent plant for winter bedding. *Y. flamentosa*, the North American Silk Grass, is a beautiful species, nearly stemless,

with long, narrow, rich green leaves, conspicuous for the numerous thread-like appendages along the margins. Of this there is a distinct and pretty form with cream-coloured variegation; but it is only when planted in a warm, rather dry soil that the true leaf colour is revealed. *Y. angustifolia* is another narrow-leaved sort of much beauty.

Zenobias.—Two kinds of Zenobias are found in gardens, viz., *Z. speciosa*, and its variety *pulverulenta*. Of the two the last-named is decidedly the best, as it is quite as hardy as the type, and produces an abundance of snow-white, drooping, bell-shaped flowers in axillary clusters. It forms a much-branched shrub four feet high, and the under sides of its leaves and stems are powdered with white. The flowers of the type (*speciosa*), formerly known as *Andromeda cassinefolia*, are smaller, and produced a week or so after those of the variety referred to above. Although peaty soil is usually considered necessary for these charming Heathworts, one composed of loam and leaf-mould suits them admirably, provided the drainage is good and lime is not present in the soil. They are sub-evergreen. Seed ripens freely in this country, from which plants may be raised in quantity. Sow in fine soil in shallow pans or boxes, and, as the seed is very small, be careful not to bury it too deeply. With the variety *pulverulenta*, cuttings or layers answer best.

Mistletoe.—There is something strangely attractive about this plant, something mysterious that arouses the imagination. It is attractive, and yet, at the same time, slightly repellent, for it has somewhat of a vampire nature in that it sucks out and lives upon the life-blood of some honest tree. Moreover, it is both ugly and pleasant to see, for it hangs in rather ungainly bunches and masses, and yet is beautiful in detail. In form it is so simply constructed that it gives one the impression of being low in the scale of vegetable creation. It is built almost as simply as a scant weed, but there is a rare and strange kind of beauty in the individual twigs, and especially in the relation of colour between the golden green leaf and the pearl white berry. The trees it most frequents are Lime, Apple, Poplar, Thorn, and Mountain Ash. The seed can be sown by fixing the berry either in an artificial slit, or a crack in the bark of any likely tree, preferably on the under side of a branch, and place a little strip of linen over for a time to prevent birds eating the seed. Such sowings are often ineffectual, because the seed is used before it is ripe. It is no use taking it from boughs and sowing about Christmas time, for the seed is not ripe till quite two months later. Mistletoe abounds in some English west country orchards, but is in still greater profusion in those of Brittany.

BEAUTIFUL CRABS

The Crabs are among the most picturesque and beautiful of trees for the orchard garden and lawn, and there are many kinds to select from:—John Downie, brilliant, with crimson fruits in autumn; the Dartmouth, Siberian, and many others, all shapely trees for the outskirts of the lawn. Mr.

YUCCA ON LAWN.

Bunyard, of Maidstone, writes:—"We find that the Dartmouth and John Downie make admirable bushes on the Paradise stock, and they require but little pruning when once the trees are shaped, as the festoons of elegant fruit appear to the best advantage on the two years' shoots. To take the Siberian or Cherry Apple race first, we have the Scarlet Siberian, which is the best known. This forms a pretty, open tree, but is liable to mildew in the foliage, and thus looks rather bare at times, but this enables the thickly-set fruit in branches to appear to advantage, and very handsome they look in the months of August and September. There is a new kind of great beauty, wonderfully free in bearing, sent out by Cheal & Sons under the name of Scarlet Crab. The fruit is smaller than the Siberian, but very thickly set on the branches, and the colour is intense and striking. The tree is more upright than the Siberian, with ample foliage. We consider it a great addition. The yellow Siberian has rather larger fruit than the type, and, as a contrast, is well worth culture. John Downie has more the growth of an apple, sturdy, with ample foliage, and its fruit is oval and produced in festoons, which give it a striking appearance. It is larger than the Siberians, and of an intensely bright scarlet on the sunny side, and orange on the shaded positions. As a decorative tree it stands in the front rank, and its fruit is also useful for table decorations and harvest festivals.

"The Orange Crab, sent out by Saltmarsh of Chelmsford, is a very pretty pale yellow fruit, larger than the Siberian, and more like a cherry in shape. To come to the larger fruited kinds, the Fairy Apple makes a splendid garden bush, and fruits very freely on the Paradise stock; its fruit is lemon-coloured with pink flesh, and of a crab shape." Mr. Bunyard then alludes to the beauty of the Mammoth and Montreal Crab and Transcendent Crab from America, and the Old English transparent Crab. "The most beautiful of all is the Hyslop or Dartmouth Crab from America; this gives plum-like fruit of a mulberry crimson colour, and carries a rich bloom, so that it is often taken for a plum. It is a splendid sort for decoration, grows freely, and produces a heavy crop. The whole of these are beautiful in flower in May, and their double claims of flower and fruit commend them to all planters. But they have a third virtue—they make most delicious jellies and jams when the seeds and carpels are removed, the best plan being to squeeze the pulp through a cheese cloth. When slightly sweetened they form a fine sweet sauce for game, and when well sweetened a very much relished conserve, while in syrup they are sweetmeats of the first class."

FERNS

Hardy Ferns.—Ferns are plants which, instead of blossoming and bearing seed, only produce leaves or fronds upon which, usually on the back, little heaps or lines of brownish powder appear. This powder is really tiny pods or capsules, and these pods or capsules are filled with a still finer powder, called "spores." These spores, falling on a damp place, grow into little green scales like green herring scales, and after bearing little flowers on these under sides, far too small to be seen without a strong magnifying glass, tiny seeds are found, and presently little ferns grow from these in due course. As some Fern fronds are quite covered with heaps of tiny pods, and each pod may have fifty or sixty spores in it, a single Fern plant may produce millions every season. We may, therefore, usually tell a Fern from a flowering plant by noting that there are no flowers or buds in the first place and then by looking on the frond backs, when if we find such lines or dots we may be quite sure it is a Fern.

Another sign of a Fern is seen in the way the leaves or fronds grow. They always begin coiled up tightly into a sort of knot at the top of a stalk; that knot loosens itself, and then we shall see that all the side divisions are coiled up too, so that there is a constant unrolling and spreading out until the whole of the frond is flat and complete. No flowering plant does this; if we look at a plant of Cow Parsley, which is so very like a Fern, we find the leaves push up from the centre in a sharp spiky fashion, and are straight at all stages of growth. Recollecting these two points of difference it will be easy at any rate to say whether a plant is a Fern or a flowering one. Having got so far we shall find that Ferns are of many sorts, their fronds are made in very different ways, and the dots and lines of spores will be found to be always the same upon the same sort of Fern. It has been found that, although the shape and make of the frond may be very different even in the same sort or "species"—that is, finer or coarser cut, or of smaller or larger size—no one species or family will have dots on one

plant and lines on another, and as some species have lines along the frond edges, others along their middles, and others in slanting stripes, while others have round heaps or dots, some with little covers over them and some without, it is easy to see that, knowing what sort of an arrangement a "species" has, we can now go a step further and not only say "this is a Fern," but also "this a Fern of such and such a family." The Ferns of the world generally consist of a large number of families or genera (plural of genus or kind), and these families are split up into a far greater number of species or members of the family, which, like members of a human family, are very different to each other. Each genus or family has its special way of bearing the spores, and no matter how different its members or species may appear they will all, as we have said, carry their spores in a similar way. Finally, there is often great variety of form among the plants of the same species, so that Ferns are really classed under three heads—genera or families, species or members of families, and varieties or forms of species. Thus, as there are many genera, many species of each genus, and sometimes many varieties of a species, it is clear that there must be thousands of different forms of Ferns taking them altogether. This being so we will first deal only with such Ferns as are to be found in Great Britain, and most of which we may come across in our country walks, especially in our western counties, Devon, Dorset, Cornwall, &c., but in point of fact they exist all over the country where there is plenty of shade and moisture, and people are sensible enough not to pull them up because they are pretty, as is too often done.

Curious Forms of Ferns.—In Great Britain we have only eighteen genera and forty-five species, but, strangely enough, so many curious forms have been found growing wild among the common ones that certainly *two thousand* varieties exist and probably many more. Many of these varieties are far more beautiful than the common ones, some bearing beautiful tassels at all their tips, some prettily frilled, some condensed or dwarfed, and some so finely cut as to appear like lovely feathers. Most of us know the pretty Hart's-tongue, with its long, shining, green, strap-like fronds, sometimes growing big in the hedge, and sometimes starring an old wall with small plants. This one Fern has "sported," as it is called, into several hundred different fashions, some like little balls of moss, and some like yard high curly frills, some with cups and pockets at the tips, some branched and tasselled, and some again with the usually smooth green surface ridged

and channelled and adorned in many different ways, or with the edges prettily cut. All the commonest kinds of Ferns have varied more or less in similar ways according to their nature, so that taking our British Ferns by themselves, we can make beautiful collections either in our gardens or indoors, provided we give a little thought to their needs and a little care to their culture. One great advantage possessed by our home Ferns is that they are (all but two rare ones, the Maidenhair Fern and Sea Spleenwort) perfectly hardy, so that we need no hot water piping in the winter as we do for tender Ferns from warm climates.

There is, however, one thing which they cannot stand, and that is drought or want of water at the roots. If we keep our eyes open when among the Ferns in the country, leaving the common Bracken out of the question, we shall always find them in best condition in shady moss lands, under the shelter of the hedges, or in shady but not too shady woods, while if we look a little deeper into the matter we shall note that in very dark nooks the Ferns are drawn up and weakly. In windy sunny places also we shall find their delicate fronds browned by the sun, and ragged and worn by the rubbing together caused by the wind, and from all these facts we shall gather, if we think a bit, that Ferns like (1) Plenty of daylight but little sunshine; (2) Constant moisture at the roots; and (3) Shelter from rough winds.

Finally, if we examine the places where they grow we shall usually find plenty of decayed leaves making an open soil, and that on stiff clay few if any Ferns exist. We shall also note that chinks in rocks and the crevices in old walls and stone dykes are often full of little Ferns, and in time we shall see that some species only grow in such positions and nowhere else, all of which facts teach us something of which the more we remember and apply to the plants we possess the greater will be our success in growing them. A good general compost is a mixture of good loam and leaf-mould, or peat-mould, in equal parts, with say a fifth of coarse silver sand.

Ferns in the Garden.—*Culture*—To grow Ferns satisfactorily in a garden we must recollect what nature has taught us, and choose a spot sheltered from sun and wind as much as possible, but otherwise with plenty of daylight; and we must also indulge them with a soil containing plenty of leaf-mould. Rocky slopes will have taught us also that something in the rockery line will help, but in making a rockery it should never be forgotten that the Ferns are the main ornament of it, and hence that the rocks, whether real or artificial, should not

FERNS IN WOODLAND AT BATTLE ABBEY.

be mixed up with shells and corals, or similar things which are entirely out of place. To start a rockery, say under a north wall, the ground should be well forked up, and as a foundation any broken brick rubbish may well be mixed with the subsoil to drain it and keep it sweet; if the soil generally be good garden soil and not clayey it will do as it is, though an addition of leaf-mould is always advantageous. The bed should be made nearly a foot higher than is needed as it is sure to settle, and the rocks or burrs should be well bedded in irregularly, leaving spaces between for planting the Ferns subsequently. When finished water well and let it settle, then plant the Ferns singly close under the edges of the rocks, so that their crowns are just level with the soil but not covered, water them well in, and the work is done. Care must be used in planting so that small growers are not hidden by larger ones when growth sets in. Finally, having made a pretty rockery in a good place, do not do as nearly everybody does, forget all about the beautiful varieties we have mentioned and crowd up your space with common Ferns, which those who know regard as weeds.

Ferns in the House.—Many of our finest varieties will form lovely specimens in well-lighted north or shaded windows, if grown in pots, kept properly watered, and, above all things, always retained in one position. Ferns, like all other plants, *will* grow towards the light, and arrange their fronds to catch as much of it as they can, the result being a very graceful one, yet innumerable people, ladies especially, who grow Ferns indoors in windows, will keep turning them round to face the company, *i.e.* turn their backs to the light. Now, as many Ferns are practically developing new fronds all through the growing season, and these fronds as they unroll bend towards the light, stiffening as they develop, a Fern thus twisted and turned about becomes in itself twisted and out of shape, and all its native elegance is spoiled. The best plan is to mark the pot itself and keep that mark always either to back or front as the case may be. Much as Ferns like water, it is not well to let them stand in saucers full of it. A good plan is to use a large saucer and insert a smaller one inside it in which the pot stands. The large saucer can then be kept filled and will supply the pot, not by soakage, but by percolation through the smaller saucer, a much healthier way. The more light, but not sun, the sturdier the Fern; no Fern will thrive in a dark corner far away from the window, and gas fumes are poison to the hardiest.

Ferns in Wardian Cases.—Practically the only satisfactory Ferns for Wardian cases are the Filmies; all others are

apt to get drawn or to outgrow the limited space. Our native Filmy Ferns (*Hymenophyllum tunbridgense* and *Wilsonii*), and the lovely Bristle Fern (*Trichomanes radicans*), of which there are several beautiful varieties, do well in a perfectly close case if pegged down on pieces of limestone or sandstone embedded in an open peaty compost. After pegging down, this should be covered with a handful or so of sandy compost and then watered overhead so heavily that this mulching is washed well into them, thus establishing them firmly, but not burying them. This done, they may be left untouched for months together, save a watering when needed. That beautiful New Zealand Fern (*Todea superba*) makes a grand central plant if the case be large, and it is as hardy as grass. The Ferns must never see the sun, and drought is absolutely fatal. They are the children of caves and hollows by, and even under, waterfalls, and shrivel at once if exposed to dry air or sunshine. The need for strong light is consequently less, and hence they may be grown in duskier situations than Ferns that love the air. Judiciously aired and well lighted, the Wardian case may accommodate a small rockery containing some of our small growing Spleenworts, such as *Asplenium trichomanes* and its varieties, which constitute a pretty group, and will thrive provided the fronds are *not* wetted and the plants be carefully installed in rocky chinks, limestone for preference, soil sandy leaf-mould. Pretty, temporary arrangements may also be made by filling the bottom of the case with *fresh* cocoanut fibre and bedding small thumb pots therein containing small growing specimens of Hart's-tongues, Spleenworts, &c., which can easily be shifted when growth renders it necessary. Good drainage is essential; water-logged soil breeds a sourness fatal to everything.

Ferns in the Conservatory.—Here, of course, we have ampler room for our plants, but also different conditions. Most conservatories are built for flowers and hence placed to get as much sunshine as possible, and in such we find the Ferns usually either ignominiously dumped under the staging or stunted and out of condition by uncongenial baking. The ideal Fernery under glass never sees the sun at all, a deep ravine, as it were, with a glass roof. However, few of us being millionaires, we must do with what we can get, and hence if we have a conservatory attached to a house and facing north, a large part of it will have sufficient shade from the house itself, and the balance we can shade by screen so as to get at anyrate within measurable distance of our ideal. The prettiest way of dealing with a fernery of this class is to build up rockwork within it, broken up by red-tiled paths in any design

that permits of easy access to all the plants in the house. This is most essential; plants out of reach invariably become the lurking-places of vermin; or sooner or later get overgrown and neglected. Experience, however, has taught us that rockwork under glass is very apt in time to harbour vermin, and that, consequently, substantial staging and pot culture are preferable. Shifting is easier when growth necessitates it, and in many ways the less attractive appearance is compensated for by greater convenience. Slate shelves, covered an inch or so deep with cinders or ashes, are better than wooden ones, as the pots standing on porous material are less apt to get sour. For hardy Ferns no provision for heating in winter is necessary; they are all the better for a thorough rest, and if excited into growth by warmth before their time become weakly in constitution and liable to vermin. In the autumn those species of Ferns which are deciduous—that is, are not evergreen, but die down for the winter—create, of course, considerable gaps, but as other species are quite evergreen, a little rearrangement rectifies matters. It must be borne in mind that only the fronds die, the plant is only asleep and still has need of water, though to a less extent. To allow the soil in the pots to become dust dry is simply to kill the plants within.

Ferns in Frames.—Ferns can be grown well in frames in two ways, either in pots on shelves, on a tiled bottom, or planted in a leaf-mould bed upon which the frame is merely set. The lights must either slope toward the north or north-east, or be shaded from too hot sun. A very good plan is to dig out a sufficiently large hole or trench, pile the soil up on the south side so as to make a rockery facing south, suitable for Alpine plants, and then put leafy compost in the bottom of the excavation. Plant the Ferns and put on the lights at a steepish slope towards the north; the earthy bank keeps the frame cool, and can be retained in place by roofing slates. In such frames beautiful collections of Polypodies, Blechnums, Spleenworts, and Hart's-tongues can be grown to perfection, but naturally the tall growing Male Ferns, Lady Ferns, and Shield Ferns require too much head-room. Here again the plants may be bedded in pots sunk in cocoanut fibre, provided this be changed from time to time.

Spore-Sowing and Propagation.—Certainly the most interesting way of increasing Ferns is by the spores, as in this way there is always a chance of getting quite new things. About July, generally speaking, the spores are brown and ripe, and if we take a frond bearing spores and lay it on a sheet of glazed white paper for an hour or two we shall see them shed

in great numbers, as a sort of brown stain on the paper. Fill small pans or pots nearly full with fern compost, putting some crocks in first for drainage, top this with a little crumbled loam, place a piece of paper on top to prevent disturbance, and pour boiling water upon it until it runs out of the bottom hot enough to scald the finger. Remove the paper and let the soil cool. Now scatter the spores *extremely thinly* on the top, put a piece of glass over and place the pot or pan in a cool, damp, shady corner where no worms can get into it. In a week or two a green tint appears, and very soon this will become a mass of small scales, like green herring scales. A little longer and from these will arise tiny fronds which, if the sowing has been thin enough, may be left to develop into larger Ferns, which can then be pricked out and grown on. Hart's-tongues, Lady Ferns, and Male Ferns are perhaps the easiest to raise, and, of course, good varieties should be sown, as there is no advantage in raising common ones. Established Ferns can be multiplied in several ways. Many form crowns from which the fronds arise shuttlecock fashion ; in time these crowns split and form twins, or other crowns appear on the side. Each crown is really an independent plant, and can be pulled away, or carefully cut off, and treated as such. Some have creeping roots, such as the Polypodies, which run about in all directions ; every growing tip if cut off with an inch or so of fleshy roots and a frond or two will form a plant. Others, like some of the Shield Ferns, bear little plants on their fronds, and in that case the frond should be cut off, and the part bearing the young ones severed and pegged down on good soil, when they will root in, and can, later on, be parted and potted. Finally, all Shuttlecock Ferns grow better and stronger if kept to one crown, and hence when other crowns appear they should be taken off.

BEST VARIETIES

Having now given a general idea of how Ferns should be treated, a short list of those worthy of attention, and such as a beginner may safely start with at little cost, will be useful. There are a great number of comparatively rare and beautiful varieties in addition, which rank, however, as prizes to which the more advanced students may aspire, space precluding more than a selection of current "gems" in the trade.

The Lady Fern (*Athyrium filix fœmina*).—The best crested or tasselled varieties are *A. f. f. Victoriæ, acrocladon, cristatum, Frizelliæ cristatum* (*applebyanum*), *curtum cristatum, superbum cristatum,* and

HARTS' TONGUE FERNS AT FOOT OF WALL.

percristatum, *corymbiferum*, James; *depauperatum*, *orbiculatum*, *gemmatum*, and *multifurcatum*. The best plumose or extra feathery ones: *A. f. f. pl.* Axminster, Horsfall, *divaricatum*, *plumosum elegans*, Parsons; and any of Mr. Druery's strain of "superbum," which are the finest of all. Other "gems" of different sections are the dwarf congested forms.

The Buckler Ferns (*Lastreas*).—The best Male Ferns (*L. filix-mas* and *L. pseudo-mas*) are *L. p. m. cristata* (The King of the Male Ferns) and its narrow form *L. p. m. c. angustata*, *L. p. m. polydactyla*, *L. f. m. grandiceps*, *crispa gracilis* (dwarf), *crispa cristata angustata* (dwarf), *ramossissima*, *ramulosissima grandiceps Lowi*, *revolvens*, and *Ballandiæ*.

The Mountain Buckler Fern (*L. montana*) must be grown in moist loam. It has sported freely; the best are *L. m. cristata*, Barnes; and *grandiceps*, *cristata gracile*, Druery; *plumosa*, *Barnesii*, *ramo-coronans*, Barnes; and *congesta*.

The Broad Buckler Fern (*L. dilatata*) has given us *L. d. cristata*, Oscroft; *grandiceps*, Barnes; *lepidota* and *lepidota cristata*, and others.

The Hay-scented Fern (*L. æmula*), a pretty crested form, and *L. æ. cristata*.

The Shield Ferns, or Polystichums, being evergreen, are perhaps the most serviceable of all. The beautiful forms of these are innumerable. We can only indicate a few.

The Holly Fern (*P. Lonchitis*).—*P. L. cristata* is very pretty. This can only be grown outside in a moist situation, facing north, and under the shelter of a big piece of rock or burr; so treated it does well, but rarely in the open. The type is pretty and should be tried first.

The Hard Shield Fern (*P. aculeatum*).—A capital Fern in any of its forms. There are several *grandiceps*, all good, but the prince of the family is *P. ac. pulcherrimum*, which under glass has no equal in its own particular line, a perfectly graceful shuttlecock, four feet high and erect, with exquisite finish.

The Soft Shield Fern (*P. angulare*).—The best are the *plumoso* and *decompositum* sections; *P. a. pl. densum*, *laxum*, *robustum*; *P. a. pl.*, Wollaston; *cristatum*, Wollaston; *grandiceps* (several, all good), *tripinnatum* (several), *acutilobum*, *revolvens*, and *congestum*, represent charming types of which scores of sub-types exist.

The Hart's-tongue (*Scolopendrium vulgare*).—As already stated the forms of this number hundreds. We can only indicate all the *crispums* as fine frilled varieties, the more beautiful being the fimbriated section of Stansfield and Cropper. Tasselled forms vary from a few finger-like extensions on the frond tip to division into balls of moss, such as Kelway's *densum*. Some of the fimbriate *crispums* are also beautifully tasselled.

The Polypodies.—The Oak Fern (*P. Dryopteris*), the Beech Fern (*P. Phegopteris*), and the Limestone Polypody (*P. calcareum*), are three pretty little Ferns, which should be grown in pans with plenty of leaf-mould and a little lime for the last. There are no good varieties, but they are too pretty in make and colour to ignore. In the open they

want a lot of shelter; best grown under glass—deciduous. The Common Polypody (*P. vulgare*) is a very different plant; it is quite evergreen, and will do well anywhere on loose leafy or peaty compost. It has a thick fleshy running root-stock or rhizome, and this must be planted near or even on the surface. A good plan is to grow it in largish shallow pans, and to stand these *on* (not *in*) a redware saucer which is kept full of water. This Fern is quite evergreen, and has varied much, so that a pretty collection can be made of its forms. The best are *P. v. cambricum* or the Welsh Polypody, of which the finest types are *Prestonii*, *Hadwinii*, and *Barrowii*. These are true *plumosums* and lovely.

The Hard Fern (*Blechnum Spicant*) is a pretty evergreen Fern, with two sorts of fronds—lax leafy ones which are barren, and tall stiff-growing stalky ones which bear the spores. The Fern must be watered with rain or soft water, as lime kills it.

Of the *Spleenworts* only one species has varied to any extent, viz., the Maidenhair Spleenwort (*Asplenium Trichomanes*). This, as we have said, may be grown in a Wardian case. It has sported into fine charming forms; *A. T. incisum* is the plumose form and Clapham's is the best. The black Maidenhair Spleenwort (*A. Adiantum-nigrum*) has yielded one crested form, *A. Ad. n. grandiceps*, very pretty but rather difficult to grow.

The Royal Fern (*Osmunda regalis*) is a grand Fern for a moist corner or a large pot. As it is a bog Fern it must be kept well watered, and hence does well by a pond side. It bears all its spores on the frond tips in somewhat flower-like bunches, hence its name of Flowering Fern. The variety *cristata* is beautifully tasselled.

Finally, a spare corner or corners in many a garden might well be tenanted by the Bracken (*Pteris aquilina*), not in its common form, but in several splendidly crested and otherwise varied types. It is one of the easiest Ferns to raise from spores, and one of the hardiest to shift or to establish after shifting. Spores sown one year in pans make pretty plants the next, and if turned out into the garden in the early autumn will come up freely in the following spring, and soon make handsome clumps, while, curiously enough, if kept under glass and frozen, they are almost sure to be killed.

GREENHOUSE FERNS

The beauty of the plant house and home is derived in a large measure from the cool-coloured and graceful fronds of Ferns too tender to live in the open garden. Flowers are absent, but the charming tints of the young fronds and the graceful growth of the plants are features restful to the eye. Ferns may be grown in many ways, and the majority will develop rapidly in heat. This fact is taken advantage of by many cultivators who supply Covent Garden market, from whence the plants drift to the barrows of the street

hawkers. The fact that these plants, when after a short period in a greenhouse or living room, quickly lose their freshness is in many cases accepted as proof of their delicate constitution, whereas the fault is in the way they have been treated. This also applies to many plants other than Ferns, the object of the market grower being to get a saleable plant in as short a time as possible. With regard to newly-purchased Ferns, when the conditions under which they have been growing are unknown, it is better to assume that they have been treated as above described, and harden them off when first obtained. Thus they should be kept away from draughts and bright sunshine; indeed, Ferns always require shading from the full rays of the sun. The above directions are given with regard to Ferns purchased from dealers, but to the amateur with a greenhouse there is another way of obtaining them—and that is, given a few to start with, they may be readily propagated from. There are three ways of increasing Ferns, firstly by spores, secondly by division, and thirdly some kinds produce small plants on the tips of the fronds, and it is only necessary to peg them down on a pot or pan of soil, when, if kept watered, these tiny plants will form roots of their own, and in time may be potted singly into small pots.

Propagation by Spores.—The spores which in Ferns are equivalent to the seeds of flowering plants are usually arranged on the under sides of the fronds in dots or lines; but there are exceptions to this, as in a few cases the spore-bearing frond is quite distinct from the others. Myriads of spores are contained on a single frond. They are covered with what is known as spore cases—that is, enclosed within a kind of scale. When ripe these cases burst, and the contents are then scattered. The spores are so light that they float hither and thither till they finally rest, and if the spot is favourable to their development they commence to grow. In gathering spores for sowing care should be taken to see that the spore cases are not already opened, and the spores themselves discharged, which is apt to happen unless special attention is directed to the matter. To secure the spores cut off the frond or fronds just as a few of the earliest spore cases commence to burst and discharge their contents. Then fold them up in a sheet of white paper and place in a dry spot. In a few days the spores will be found loose in the paper, like a pinch of the finest dust. For sowing the spores five-inch pots are suitable. They must be prepared by putting two inches of broken crocks in the bottom, and filled to within a inch of the rim with a mixture of loam, peat, and

sand passed through a sieve with a quarter of an inch mesh, and pressed down moderately firm and smooth. As a moss-like growth frequently makes its appearance on the surface of the soil and chokes the spores as they commence to grow, if possible bake the soil before it is used, and thus destroy all germs of vegetable life. Having thus prepared the pots water them thoroughly through a fine rose, and while the surface is still wet sprinkle on the spores as thinly as possible. Then cover with a pane of glass, and stand each pot in a shallow pan of water, which will serve to keep the soil moist without overhead watering, as, however carefully done, this is apt to wash the spores away. In time (a few weeks in many cases) a dense moss-like growth will overspread the soil. This usually consists of growing spores packed closely together, too closely in fact to allow of their development. They must then be pricked off, and this is carried out by preparing some pots as for sowing the spores, except that the soil must be very lightly pressed down. Then with a pointed stick pick up a tiny tuft of the growing spores, place it on the surface of the soil, and press into position gently with the finger. Water through a fine rose, keep in a humid atmosphere, and give careful attention to shading, &c.; they will continue to grow, and in time push up fronds. When large enough they must be potted off singly into small pots. February and March are the best months for sowing the spores, as there is a long growing season before winter. Although the raising of Fern spores is extremely interesting, and large quantities are obtained in this way in nurseries, it is a method that can scarcely be recommended to quite a beginner, as a considerable amount of care and knowledge is necessary to bring it to a successful issue. Still, in a Fern house where the atmosphere is always kept moist, naturally sown plants will spring up in all directions, the Maidenhair and some kinds of Pteris being as a rule conspicuous.

Propagation by Division.—The second method of propagating Ferns is by division, and is best carried out in the spring. All Ferns that produce several crowns can be propagated in this way, and, as a rule, division should be practised with a large knife, as any attempt to disentangle a crowded mass of roots is likely to result in greater injury than a clean cut. After potting keep the divided plants rather closer if possible, and additionally shade until the young roots are active in the new soil.

Soil.—With regard to the soil most suitable for Ferns it was at one time considered absolutely necessary that the larger portion of it must be peat, but these ideas have been

considerably modified of late years, and some cultivators grow many Ferns in almost pure loam. Still, with few exceptions, the most suitable compost is two-parts loam to one-part each of leaf-mould and peat, and about half a part of sand. When there is no peat its place may be taken by an additional part of leaf-mould, and *vice versa*. Ferns as a rule delight in plenty of water when growing freely, but it is important to drain the soil well, as stagnant moisture is quickly fatal not only to Ferns but to all classes of plants. Among the numerous plants used for the embellishment of the dwelling-house this excess of moisture is more fatal than anything else. Thus, when the plants are placed in vases of different kinds which have no provision to allow of the escape of surplus water, they should be removed to be watered, and allowed to drain for a few minutes before returning them to their place. Many Ferns are suitable for growing in suspended pots or baskets, in which situation they are very attractive. Shading is less indulged in than it formerly was, and the same amount that is needed by the average occupants of the greenhouse will also suit the majority of Ferns.

There are now hundreds of different kinds in cultivation, and a selection of the best for greenhouse culture is herewith given. The cultural requirements of these selected kinds are not at all exacting.

Adiantum Capillus-veneris (Maiden-hair)
„ cuneatum
„ „ gracillimum
„ decorum
„ formosum
„ hispidulum
Asplenium bulbiferum
„ Colensoi
Cyrtomium falcatum
Davallia bullata
„ canariensis (Hare's Foot Fern)
Doryopteris palmata
Lastrea aristata variegata
„ decomposita
„ lepida
„ patens
Lomaria ciliata
Nephrodium molle
„ „ corymbiferum
Onychium japonicum
Osmunda japonica corymbifera
„ palustris
Pellæa hastata
„ rotundifolia
Polypodium aureum
„ „ glaucum
„ Schneideri
Polystichum capense
„ setosum
Pteris arguta
„ argyræa
„ cretica
„ „ albo lineata
„ „ Mayi
„ longifolia
„ serrulata (Ribbon Fern)
„ „ cristata
„ „ major
„ tremula
„ „ smithiana
„ Wimsetti

Filmy Ferns.—Until the invention of the Wardian case the culture of the Filmy Ferns was a failure, but given a fair start and the observance of a little common-sense, and there is no class of Ferns which so well repays a minimum of trouble with a maximum of pleasure. The Filmy Ferns, so called from the delicate and diaphanous nature of their fronds, rank decidedly among the most beautiful plants extant. In their native haunts, which are mainly situated in hilly regions, they clothe the rocks, leafy banks, and the trunks of trees and tree ferns with dense masses of translucent frondage, ranging from minute moss-like growths up to the stately fronds of the Todeas, and varying in form from the exquisitely slender hair-like types of *Trichomanes trichoideum* to the broad, kidney-shaped, almost leathery foliage of *T. reniforme* even in one and the same genus. In the vast majority of cases they spread by means of thin, ramifying rhizomes, which cling to rock and other congenial sites and form mat-like cushions of glistening emerald verdure. Wherever they are found, the conditions are such that the atmosphere is constantly saturated with moisture, and it will also be seen that perpetual shade is afforded by the loftier vegetation amid which they thrive. Transport them even for a few minutes into dry air, and they quickly shrivel. From the nature of their habitats, therefore, it is easy to outline their cultural requirements, both as regards soil and aerial conditions, and we can at once perceive that a close Wardian case or even a bell-glass in a cool, shady position, or, better still, a sunken brick-lined and glass-covered pit in a shady corner of the garden, secure the main essentials. The soil, as we have seen, consists entirely of the débris of vegetation mixed with more or less broken rocks; or there may be no soil at all, as in the case of the fern-clad tree trunks. In practice, good brown lumpy peat affords precisely the requisite foothold; hence, taking a fair-sized Wardian case, we should secure the proper drainage—for the Filmies are not Bog Ferns—by a careful and liberal supply of broken pots and broken bricks, nearly filling the receptacle with these. After this pile up the *lumpiest* peat possible, mingling it liberally with coarse silver sand and lumps of porous stone, and, finally, top the compost with pieces of rock. This done, take the clumps of Filmies and peg them securely down over the rocks in the desired positions, leaving room between the species for subsequent spreading. Then prepare some finer peaty compost mixed liberally with coarse silver sand, and sift this over the clumps until they are fairly buried, finally giving such a drastic drenching from jug

WILD FERNS IN DEVONSHIRE.

or water-can as will wash this compost entirely in and leave the Ferns on the surface again. They are now fairly installed, and all we have to do is to replace the glass, close all openings as tightly as possible, and leave them severely alone. All direct sunshine must be excluded, but as much daylight afforded as possible, hence a position close to a north window suits admirably. As a rule, after such an installation, they may be left entirely untouched for several weeks, but no harm will be done by an occasional gentle spraying of pure rain water over the fronds. After a time it will be seen that new fronds are pushing up here and there, and eventually the fresh growth will entirely rectify the effects of disturbance, and all the loveliness of the plants will be gradually developed. One great charm about the Filmy Ferns is their persistent verdure, the fronds in some cases remaining green and fresh through several seasons; hence there is no unsightly seasonal gap such as occur with their drier kindred. Make the first attempt with our hardy British species, viz., the dwarf-growing *Hymenophyllum unilaterale* and *H. tunbridgense*, which form dense mats of delicate mossy growth a few inches high at the utmost, and the delightful Bristle or Killarney Fern (*Trichomanes radicans*), which has a stouter rhizome and fronds quite large enough to furnish any ordinary Wardian case. Of this latter there are several beautiful varieties, especially *T. r. dilatatum*, a grand leafy form, with fronds a foot high, and *T. r. Andrewsii*, *densum*, *dissectum*, and *cambricum*, all varied in cutting and make. It is beyond question that no Ferns are so well adapted as the Filmies for case culture in rooms; all other species, however pretty they appear when first installed, are apt to get drawn and out of health before long under such conditions, while a batch of Filmies, once fairly started, thrives well, and if properly selected will never be too large for the available space. For a large case, a central plant of that exquisite yet hardy New Zealander, *Todea superba*, may well be selected, but as a well-grown plant of this may cover a circle of four feet in diameter, it is clear that in time it will overgrow its room. Undoubtedly the easiest way to grow Filmies is to sink a pit in a shady garden nook (*i.e.* toplights but no sun), line it with bricks, red for preference, make a bed as above described, and instal the Ferns, Todeas, and others therein, covering the whole with a well-fitting light. In such a pit the writer has had Todeas, Trichomanes, and Hymenophyllums thriving marvellously, though shamefully neglected and watered once a month at the oftenest, the sunken bed supplying itself from the subsoil and the non-removal of the tight-fitting light retaining the air in the necessary moist condition.

Many of the choicest exotic Filmies are hardy, or so nearly so that they will thrive with only sufficient protection to keep out the frost. Those above named British and New Zealand are absolutely frost-proof, and make the bulk of their growth in the coolest times of the year, a clear indication that high temperature is a mistake, and this indeed is often the cause of failure where an exotic and maybe tropical origin misleads the cultivator who ignores the important facts that high elevation means coolness even in the torrid zone.

OCTOBER FRUIT.

CULTIVATION OF FRUIT

WHOLESOME fruit is as pleasant to see in the garden as the flowers scattered in the border. An Apple tree is a thing of beauty in itself, its growth is picturesque, its flowers as exquisite as those of the most treasured foreign Crab, grown for beauty alone, and its leaves turn to crimsons, yellows, and browns when the ruddy fruit still hangs on the bough. Of course in the large garden the fruit department is the most important, but when a small space is under consideration the owner must fit in things in his own way. He may prefer more Strawberries than Apples, or Plums rather than Pears. It is wise to have plenty of bush fruit, Currants, black, red, and white, and Gooseberries, with Apple trees on the Paradise stock. These rarely fail to give each year an abundance of produce, and the man who has a small garden feels a bad season more keenly than the one with broad acres, in which if one variety fails another bears abundantly, and gain and loss are in a measure equalised.

Minute details have been given to assist the novice, and it is surprising how little is known of fruit culture even by those who have possessed good gardens half their life. Rudimentary matters are as a sealed book, pruning is accomplished in such a way that the fruit promise of another year is hacked off, and then the tree is condemned as worthless. In the case of quite small gardens, where perhaps half-a-dozen fruits alone can find a place, a small selection has been given, and any variety from that selection will not prove a failure. So much depends upon individual tastes—one wants a late Apple, another an early one, and thus selections are given to meet as far as possible various inclinations.

The Apple.—Probably the most generally cultivated, and certainly the most useful, of hardy fruits is the Apple. The climate of the British Isles agrees thoroughly with this splendid fruit, as proved by the specimens annually seen at the Crystal Palace and other leading Exhibitions. There is, however, one drawback to be noted, and that is late frosts when the trees are in flower. All hardy fruit trees are, of course, liable to suffer from the same cause, though the flowers of the Apple tree, opening later than those of the Pear or Cherry, are less likely to suffer

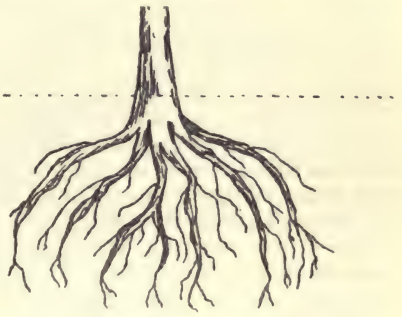
through the frost. The effects of frost may be lessened by selecting as sheltered a position as possible, such as is afforded by trees, a hedge, or wall. Not only are such shelters of service in preventing the flowers being killed by frost, but they are also useful in protecting the trees from rough winds. The cold east winds of spring injure the blossoms almost as much as frost, and the rough west winds in autumn sometimes bring down bushels of fruit. It is well to bear in mind also that the flowers of trees upon high ground, where the air is dry, are not so liable to be caught by frost as those of trees planted in damp and low positions. If the garden, therefore, affords any variety in elevation, rather choose the higher than the lower ground.

Soil.—Land that is capable of growing ordinary garden vegetables will also agree with Apple trees. If upon reaching a depth of two feet water is found, drainage is necessary. In soil rendered cold and damp by the almost continual presence of water Apple trees will not grow satisfactorily. The best and simplest method to get rid of stagnant water is to lay down drain-pipes five or six yards apart and about three feet below the surface of the soil, taking care to so place them as to give a slight fall towards, and connect them with, an outlet.

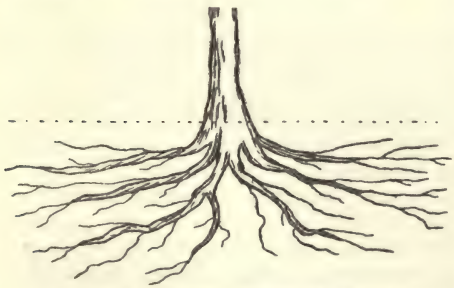
Purchasing Trees.—Always deal with a well-known firm, for strong, healthy trees, true to name, may then be relied upon. It is wise to pay a few more pence for a good article. Order in good time in the summer, so that you may rely upon having the trees in early autumn—the best season for planting. If, when they arrive, it is not possible to plant them at once, never leave the roots exposed to the air or they will soon become dry and shrivelled; take out a small trench in the border, lay in the roots of the Apple trees, and cover them over with soil until planting time. Only reliable varieties should be purchased, unless, as is sometimes the case, an exceptionally good local kind is cultivated in the neighbourhood.

Planting.—The work of planting fruit trees is important, and requires to be carefully performed. The best time to do this is in the month of November, before all the leaves have fallen, for then the trees are able to become somewhat established before the winter months, and in spring will be quite ready to make a good start. When planting is deferred until winter the ground has by then become cold and probably wet—conditions that are most unfavourable to root action. It is wiser to wait until the month of March than plant in midwinter, if it is not possible to do so in November. Naturally, trees planted at that period do not make such good growth the first season as those planted the previous autumn. Having finally decided upon the position, the next thing is to make a hole sufficiently large to comfortably hold all the roots when they are spread out. Nothing is more harmful to the well-being of any plant than to cramp its roots into a small hole. The latter should be square and not less than four feet in diameter, and the soil taken out to a depth of two feet. The soil in the bottom of the hole must also be well turned over, but not removed. A reliable guide as to the depth at which fruit trees ought to be planted is to note how deep they have been before; this can invariably be seen by examining the

bases of the stems. When the work is finished the roots nearest to the surface of the ground should be at least four or five inches deep. Many cultivators prepare the holes several *weeks* before planting time, an excellent plan. The soil is taken out as above mentioned, a few barrow-loads of new soil are added, the subsoil (that at the bottom) well broken up, and the hole is refilled. Thus, by the time the trees are ready for planting the soil has returned to its normal level and the trees are in no danger of sinking too low after planting. If, however, the trees are made firm in ground that has only been recently prepared there is little danger of their sinking low enough to affect their welfare. If the hole be two feet deep, with the subsoil well turned over, the former must be filled in such a way that the tree when placed therein is at its proper depth, as shown by the soil-mark on the stem, indicating how deep it had been previously. Say, for instance, that it was necessary to fill the hole twelve inches for this purpose, one or two barrow-loads of fresh soil should be mixed with the natural soil taken out, and a sufficient quantity of both returned together. Make this quite firm by treading it well down, and place upon the top a thin covering of new soil. Remove all bruised and broken ends of roots with a sharp knife by making an upward slanting cut. The root fibres that push from the upper portion of the cut end will then remain near the surface and not tend to grow downwards, as when the cut is made in the opposite direction. When the hole is ready to receive the tree the soil therein should be raised a little in the centre, so that when the tree is planted the roots slope slightly towards the sides of the hole.



BAD PLANTING



GOOD PLANTING: ROOTS CAREFULLY SPREAD OUT

In planting, be careful to place a few of the roots in at a time. When the lowest of all have been spread out carefully, cover them over with fresh soil. Throw the soil to the base of the stem, and with the hand draw it gently towards the extremities of the roots, which are then kept in position, and the soil is well worked in amongst them. Make this quite firm, and follow the same practice precisely with

the next layer of roots, and so on until all are covered. Then fill the hole with the remaining soil, making it firm as it is thrown in, so that when the work is finished the tree may be thoroughly safe. It is a good plan to work the soil after covering each layer of roots, and at the same time to gently shake the tree. This materially helps to settle the soil around the roots; it is then unnecessary to tread the former so hard. If the trees planted are trained as tall standards, each will need the support of a stout stake driven into the ground a few inches away from its base. Tarred string is good material with which to tie the tree to the stake, or thick wire may be used. A piece of leather, however, must be first fastened to the stem to prevent injury from the string. Firmly fix the stake driven into the ground, so that the tree will not be shaken about by rough winds. It is an excellent practice to mulch (that is, to cover with manure) the surface of the ground around newly planted fruit trees, for the roots are then kept warm during winter, moist in summer, and also at the same time derive benefit from the stimulating effects of the manure. When fruit trees are planted on grass land, never allow the grass to grow within three feet all around the base of the stem. A surprising difference is noticeable in the vigour of trees so treated and those uncared for in this respect.

Forms of Apple Trees.—Apple trees are to be obtained in several different forms, the best of which are those known as standards, half-standards, bush, pyramid, cordon, and espaliers.

Standard Trees have a clear stem of several feet from the ground before branches are formed. This form is particularly suitable for planting in grass land upon which cattle are turned, for there is then plenty of room for the latter to graze underneath the branches. Another advantage is, that the smaller fruit trees, such as Currants, Gooseberries, &c., may be cultivated amongst them. The best stock upon which to graft Standard Apple trees is the Crab. The roots of this travel a long distance, are not very fastidious as to soil, and are therefore well fitted for comparately untilled ground. Standards may be planted at a distance of twenty-four feet apart, except some of the stronger growing varieties which require a larger amount of space. If possible, plant them twice as thickly as they ultimately will be allowed to remain, that is, at twelve feet apart, and in the course of fifteen or twenty years when they have become crowded remove every alternate one.

Bush Trees.—The Bush, or open Dwarf, is a popular method of training the Apple tree, and the most suitable one for small gardens. The branches originate within a few inches of the ground, and after the base of the tree is formed, grow perpendicularly. Many trees may, therefore, be grown in a small space. The stock upon which these are grafted is the Paradise; the roots of this remain near the surface, and Apple trees grafted upon it are, as a rule, very productive.

Pyramid Trees.—Pyramid trees are also grafted upon the Paradise stock. When symmetrically trained they are very beautiful, though perhaps hardly so productive as Bush trees, and they occupy more space. From the central upright stem, branches proceed in a horizontal direction.

BUSH APPLE NEWTON WONDER.

Cordon Trees.—There are several forms of Cordon trees. Those restricted to one stem are known as Single Cordons, others may have two or even more. Cordons may either be trained in an upright or oblique direction. They are usually planted against walls, are easily managed, bear large crops of fruit, and occupy little room.

Espaliers.—These trained horizontally with two branches only are very useful for small gardens. They are suitable for planting by the side of garden walks, and should be trained on wires about eighteen inches above the ground. Considering their small size they bear fruit freely.

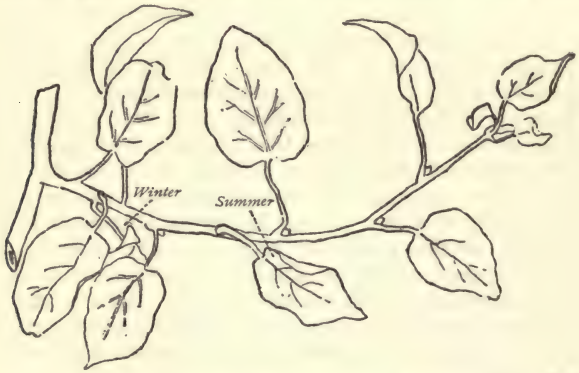
In order to thoroughly understand the pruning and training necessary to form a properly shaped Standard Apple tree, we will follow the progress of one of these from the commencement. We will suppose that a clear stem of rather more than six feet has already developed since the tree was grafted; the next operation is to form the foundation branches. In winter, cut the top off the shoot, for that portion of the wood is usually soft. The following spring allow three good shoots to grow from the buds immediately below the cut portion. These are to form the primary branches of the tree. During the summer months attend to them carefully in order to regulate and equalise their progress as much as possible. The shoot proceeding from the uppermost bud is almost sure to be the strongest, and will probably grow perpendicularly. This must be prevented, however, by bending the shoot downwards, so as to check the flow of sap and divert it to the other two branches, both of which are usually weaker. If one is particularly weak it should be brought upright, as this results in more vigorous growth. Towards the end of the summer, twelve or fifteen inches of each young branch should have been brought down almost straight. This is easily accomplished when the shoots are young. The following winter, cut or prune back the growths made during the summer to within nine or ten inches of the base of each.

An inch or two more or less does not matter, but what is of more importance is the necessity of cutting them back to two buds that point away from the centre of the tree. The two best shoots that push in an outward direction from the upper parts of each of the three branches should be encouraged to grow the following summer. There are now six branches, and they need the same careful attention during the warm months, in order to have them evenly balanced and at an equal distance from each other, as in the case of the three primary shoots of the previous year.

The primary branches of a Bush Apple tree may be formed in a similar manner, though they will, of course, in this case, originate a few inches above the surface of the ground. Numerous side shoots will develop from these branches, and when they have grown about five inches long pinch them. If they were allowed to grow until the autumn, and were then cut back to within a short distance of their bases, more shoots would push the following summer from the buds below the cut portion and the tree quickly become a mass of shoots. If, however, the side shoots are pinched when a few inches long, and

those that eventually push from the side shoots themselves (called sub-laterals) are pinched back to one leaf, the former will develop into fruit spurs—that is to say, blossom buds will form upon them. Once the tree is well established, keep the top well open so that sun and air may be freely admitted. To attain this object, all shoots that have a tendency to grow inwards or across others should be pinched, as above advised. Unduly vigorous shoots also need stopping, otherwise they destroy the symmetry of the tree and render the weak shoots woefully unproductive. Trees with branches crowded closely together and allowed to grow in all directions cannot be expected to bear a good crop of fruit.

Pruning.—The technical term pruning is applied to the annual removal of certain shoots or branches, and is practised in the cultivation of all fruit trees. The objects of pruning are to regulate the form and size of the tree, to equalise growth by restricting unduly vigorous shoots and encouraging weaker ones, to form flower-buds for the production of



APPLE. LATERAL SHOOT, SUMMER AND WINTER PRUNING
(Dotted lines show place to cut)

fruit, to admit a proper amount of light and air between the branches, and remove all dead, diseased, or otherwise useless wood.

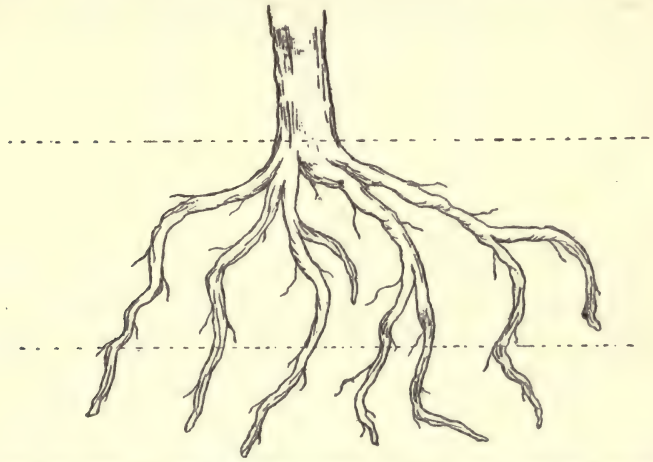
Summer Pruning.—This is certainly one of the most important operations connected with the cultivation of the Apple. As before mentioned, if the growing shoots are allowed to fully develop during the summer, and then are pruned back to two or three eyes in winter, these dormant buds or "eyes" will again most probably produce shoots the following year, and the result will eventually be a tree crowded with unproductive wood. If, however, these growths in the month of July are pinched beyond five or six leaves flower-buds will eventually form and the arrested shoot develop into a fruit spur. The object of the cultivator should be to train the branches thinly, so that sun and air may have free access to all parts, for this is the secret of success.

Winter Pruning.—This is not a troublesome task if the shoots were pinched, as advised, during the summer. Cut these back to within three or four buds of their base. All dead wood, and any that is very

A TEN-YEAR-OLD STANDARD APPLE TREE.

weak or improperly matured, as well as very strong shoots, should be removed. The leading branches of Apple trees, and any shoots intended to form new branches, where there is room, should be left about fifteen inches long. When exceptionally strong leave them rather longer, and prune a little harder when weakly. The cultivator must always have in view the ultimate shape of the Apple tree, and prune to suitably placed buds. When shortening the leading outside branches, cut back to a good bud on the outside, otherwise next year's shoot might push towards the centre of the tree.

Root Pruning.—Some varieties of Apple trees are naturally of very strong growth, and sometimes, especially if the soil in which they are planted is fairly rich, they make a large quantity of shoots which

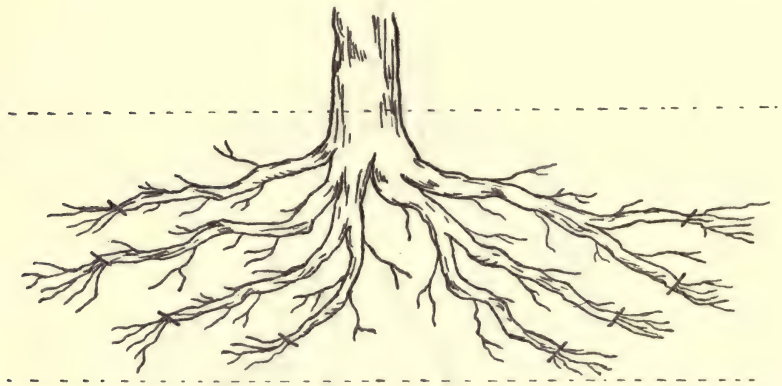


ROOT PRUNING: SHOWING ROOTS DOWN IN BAD SOIL. BELOW LOWER DOTTED LINE = SUBSOIL

produce no fruit. The reason for this is, that the roots of the tree have gone down into the subsoil, and instead of producing numerous small fibres, are simply "tap roots"—that is, they are destitute of fibres, and can take comparatively little part in supplying nourishment to keep the tree in position. To check undue luxuriance, and to promote the formation of healthy fibrous roots, the long, bare, tap roots must be pruned. To do this, make a trench about two feet deep around the tree, at a distance from it of not less than four feet. Then with a fork carefully draw away the soil from the tree, more particularly from underneath, so as to find the thick and gross growing roots. Shorten these back with an upward cut (as explained before), from which fibrous roots will be emitted, place horizontally, again cover over, and make firm.

Grafting.—The most general method of propagating the Apple is by

grafting. This operation consists in joining together, so as to form one plant, the cut surfaces of two different shoots. The shoot to be grafted is technically known as the scion, and the plant upon which it is placed is the stock. The latter is growing in the ground, and the former is a part of a shoot cut in winter from the previous year's growth. Stocks for grafting upon are raised from seeds sown early in the year out of doors. They are grown on, and transplanted several times until they have become sufficiently vigorous. Stocks should not be grafted until they are about the thickness of one's finger. In grafting, the habit and constitution of the variety require attention. It would obviously be useless in forming a Standard tree to graft a weakly variety low down, and allow it to form the stem, for the latter would never be strong enough to support the branches. The right course to pursue would be to allow the stock to form the stem and to graft higher up. If the



ROOT PRUNING: MARKS SHOW HOW TO CUT ENDS OF ROOTS AND LIFT

variety to be grafted, or "worked," as it is called, is vigorous, it may either be united near to the ground or higher up, for it would be capable of forming a stem equally as good as the stock itself. Early in the year the stock should be cut back to where the scion is to be affixed; the latter also is cut at the same season, or even earlier. If one end is inserted in the soil in a cool border outside, the scion will keep perfectly well until required for grafting. The month of March is a favourable time to perform this work, for then the sap is flowing gently. Always make sure that the inner bark of the scion fits exactly over the inner bark of the stock, for it is here that union takes place. This is the principle that underlies all grafting; no matter what method may be employed, the union of the inner barks must be effectual. One of the commonest ways is that known as—

Whip or Tongue Grafting.—The stock is prepared by first making a slanting cut as shown, so that it may terminate just above a bud. Then cut away a corresponding portion from the scion.

Be careful to make the end of the latter quite thin, or it will not fit exactly upon the stock. Afterwards make an incision on the cut portion of the scion, and also a similar one on the stock. Place the two together, so that the two small tongues fit exactly, and be sure that on one side the outer edges of the barks correspond (if the scion is smaller than the stock, the barks cannot coincide on both sides), for then

APPLE. SCION IN SADDLE GRAFTING

APPLE. CROWN OR RIND GRAFTING

APPLE. GRAFTING SADDLE

the inner barks will also be together. Endeavour to have the scion and stock as nearly as possible of the same size. Then tie tightly round with matting, and cover over with clay to prevent the air reaching the cut portions.

Saddle Grafting is another method, but cannot well be practised unless stock and scion are of equal thickness. Great care is necessary in cutting the scion as shown, or it will probably split in the centre.

Rind (Crown) Grafting is generally employed when the stock is comparatively large. The latter is cut straight across, and the scion cut obliquely, exactly as in tongue grafting, except that, instead of the tongue, a notch is made, which fits upon the cut surface of the stem. Insert the thin end of a budding knife or paper-knife between the bark and wood (these easily separate in spring), and place in the scion in the opening thus made. The thin end of the scion will thus be between the wood and bark, and the notch fits upon the cut surface. Several scions, three or four, according to the size of the stock, are usually inserted; tie round with matting, and cover with clay or grafting wax, as before advised.

Varieties.—The number of Apples in cultivation is legion. Many

of them are worthless, especially to a small grower, and others indifferent. It is essential to make a careful selection, for unless one has good varieties in the first place, after care and attention are lost. It is advisable to grow several trees of each of the best varieties rather than possess one or two of many varieties.

The Pear.—Although not so useful as the Apple, the Pear is more luscious and refreshing. It is not more difficult to grow than the Apple, although more fastidious as to climate, for in the warm southern and western counties of England, the Pear thrives better than in the more northern and colder districts. When once well established, it will live and bear fruit for many years. In soil suitable for the Apple, the Pear will also succeed. In one of the best hardy fruit gardens in the south of England, on one side of an extensive drive, Apple trees are planted, while the border on the opposite side contains splendid specimens of Pear trees throughout its full length. Providing that there is a sufficient depth of well-drained loamy soil, the Pear may be successfully grown, but land that is of a gravelly nature through which water passes away quickly is not suitable. If in possession of such land, the cultivator should always well mulch the trees early in spring by covering the surface of the soil several feet away from the stem of the tree with short litter. This is of the greatest assistance to fruit trees planted upon light land; it keeps the soil cool and moist by preventing evaporation. If the rays of the sun are allowed to strike with full force upon the ground immediately above the roots of the tree, the former becomes hard, dry, and generally cracks—a condition that is injurious to the roots. It is obvious also that mulching lessens the necessity of such frequent applications of water, and with every fall of rain the tree is benefited by the stimulating effects of the manure.

The remarks in the notes upon the Apple with reference to the best aspect and position for planting, apply equally well to the Pear. In most gardens where the space is available, a few Pear trees are generally planted against walls, and, as a rule, produce finer fruit than when planted in the open. A better crop is also usually obtained, for the flowers are to a certain extent protected from the frost and rough winds to which Pear trees in the open are exposed in spring time. It is not, however, everywhere that wall space is available. We will, therefore, first endeavour to make clear the culture of a Pear tree not against a wall. A Pear tree in the open may either be in the form of a standard, pyramid, bush, or espalier. The description of each of these will be found under the heading of The Apple. The cultural details to be followed in the operations of preparing the soil, planting, &c., are also there explained, and apply to the Pear.

Stocks.—As in Apple culture the two stocks for grafting principally made use of are the "Crab" and the "Paradise," so the "Pear" and the "Quince" are the stocks upon which Pear trees are invariably grafted. Those upon the Pear stock live the longest, and are the most vigorous; the roots of this, however, are, like the Crab, far-reaching, and liable to enter the subsoil. If there is a good depth of suitable soil, trees upon the Pear stock will succeed well. Also in poor, gravelly soil, the

DURONDEAU PEAR.

roots of this stock are able to find moisture and nourishment at a distance never reached except by roots of the Quince. The Quince stock tends to dwarf trees grafted upon it, and to bring them into bearing earlier; the roots are small and fibrous—those of the Pear are long and comparatively destitute of fibres—and remain near the surface of the ground. It will be therefore understood that in a shallow soil, or one of which the subsoil is unfavourable, such a stock would be decidedly preferable. If, however, the cultivator purchases his trees from a reliable nurseryman, which is far more profitable and satisfactory than propagating oneself, they will, of course, be grafted and properly established upon their respective stocks.

Standard Trees, usually planted on grass land, or land that is not tilled with the spade, are invariably grafted upon the Pear stock. Pyramids, bushes, espaliers, &c., for planting in cultivated garden soil, are grafted on the Quince. They do not grow so large as Standard trees, and are therefore suitable for small gardens.

Pyramid.—The Pyramid Pear tree should have an upright central stem, and horizontal branches emanating from it, and gradually diminishing in size and length towards the apex of the tree. It is necessary that this should be so, for the sap naturally rushes in the first place to the top, and if this were not restricted in some way the base of the tree would be left uncared for, and probably die away. The tree also would be unfruitful; at the upper part, because of an excess of vigour, resulting in gross shoots, and lower down because of weakness and want of nourishment. The equalisation of the flow of sap to all parts is an important consideration in the training of fruit trees, and should constantly be kept in mind as an aid to fruitfulness. If Pyramid Pear trees are grafted on the Quince stock, they may be planted about six feet apart, but if on the Pear stock, they should not be closer together than nine feet or ten feet.

Bush.—The Bush form, a somewhat similar kind of tree, has no strictly upright central stem; its primary branches originate within a few inches of the ground to where the central stem was cut back during the formation of the young tree. These branches, from which others are also developed, after spreading horizontally so as to form, as it were, a cup-shaped base, grow perpendicularly. A large number of Bush trees may be cultivated in a small space, as they need not be planted more than five feet or six feet apart.

Standards.—Standard Pear trees are almost invariably grafted upon the Pear stock, and, as has been mentioned, are usually planted on grass land. As is the case of Standard Apple trees, bush fruits, such as gooseberries and currants, may be grown underneath. The clear stem of Standard trees, before branches are formed, is, as a rule, about six feet from the ground. The primary branches originate in the same way as with the Bush tree, but they are allowed to grow more freely, no particular shape or form being aimed at. The branches, of course, are not permitted to grow in all directions, or to crowd each other, but the head of a Standard tree has no distinct design as in the case of Bush and Pyramid.

Espalier.—This is a desirable method of training the Pear, for it possesses several good points. Trees so trained do not take up so much space in the garden; they are easily accessible, not difficult to manage, are partially protected, and also succeed well. The espalier, or trellis-work, upon which to train them can be quickly constructed. It is necessary to obtain several stout poles or iron rods, six feet above ground, and some stout wire. The poles or rods are erected at intervals, and wires, placed about twelve inches apart, are connected with each one. Several forms of Pear trees, horizontal, fan-shaped, and cordons, are grown against such espaliers, to which reference will be made when treating of wall-trees.

ROOT PRUNING: WAY TO CUT BACK A ROOT

Summer Treatment.—The chief points to bear in mind in the management of Pear trees, after they have been properly planted in suitable ground, are as follows:—Each branch and shoot must have ample room to develop and ripen, and sun and air should penetrate freely to all parts of them. All exceptionally vigorous shoots must be checked, and it will be found that those towards the top of the tree are liable to grow most strongly. If allowed to go on unchecked the lower branches would correspondingly become weak. Never allow a branch to form unless there is sufficient room for it to grow without overcrowding the tree; either cut away the shoot completely, or prune it back to form a fruit spur. The fruit of the Pear is borne upon short branches, known as fruit spurs. These naturally formed fruit spurs—that on the wild Pear are thorny branches—are produced more or less by all Pear trees. By the judicious pinching and pruning of other shoots, artificial fruit spurs may also be formed. We will endeavour to show how this may be done.

ROOT PRUNING: HOW NOT TO CUT BACK A ROOT

Take, for instance, the ends of one of the branches, *i.e.* the previous year's growth. Some fruit spurs will probably form, and some shoots will also develop. If the latter were allowed to grow throughout the summer, and the following winter were pruned back to within a few buds of their bases, next summer shoots would again push from these buds, and the result would be a mass of growth. This evidently is not the right method to adopt in order to obtain a good crop of fruit. Instead of permitting the above shoots to grow until the autumn, pinch them to within five or six leaves of their bases early in July. Laterals, or side shoots, will develop which must also be stopped when two or three inches long. By following such a

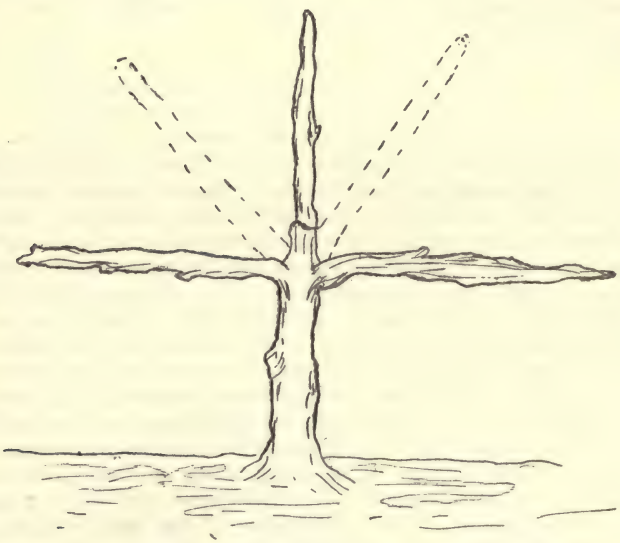
system, those shoots which, if left to grow unchecked during summer would eventually produce simply a thicket of leaves, may be induced to form flower-buds. The fruit spurs, however, should not be closer together than six or eight inches, or they, too, would probably become unfruitful. Leaf, as well as flower-buds, develop upon the spurs, so that if the latter were less than the above distance apart, those important factors in the well-being of a Pear tree, viz., sun and air, would be excluded by the mass of foliage. In pinching the summer shoots, those on the uppermost branches should first be stopped, gradually descending until the whole tree has been passed over. Do not pinch them all at one time, but allow several days to elapse between the checking of those at the top, middle, and bottom of the tree. The leading shoots of the Pear tree need not be stopped, as is necessary with the laterals. Allow them to remain at full length until the autumn.

Winter Pruning.—At the annual winter pruning, which may be carried out in November or December, the end shoots of the various leading branches should be left about nine inches or twelve inches long, according to their vigour. Always cut back to a bud that points away from the centre of the tree, so that there may be no danger of the resulting shoot growing inwards. At the winter pruning the branches may be regulated, and the true shape of the tree preserved. If any branches have grown inwards, or across others, cut them away; also remove all dead or cankered shoots, and those that are very weak.

During the hot summer months do not allow the ground immediately around the Pear trees to become hard and dry. Either cover it with manure, or run the hoe over it frequently, so as to keep the surface soil loose to maintain moisture by reducing evaporation. In a dry season water hardy fruit trees in the open sometimes, especially when the fruits are developing, as this is beneficial. By mulching and maintaining a loose surface much may be done to lessen the labour of watering.

Pear Trees on Walls.—The usual forms of Pear trees trained against walls are the horizontal, the fan-shaped, and the upright or oblique single, double, or triple cordons. If the wall is high, a fan-trained tree would cover it more quickly than a horizontally trained one. This method is not, however, so extensively practised as formerly. Horizontal-trained trees are preferred, and, during development, so that the space between them shall not be wasted, the wall is planted with cordons. Horizontal-trained trees, grafted on the Quince stock, should be planted about fifteen feet apart, and the stem kept at least eight inches from the wall so as to allow plenty of room for future growth. The formation of a tree of this description, which is not at all difficult, is carried out in the following way:—Suppose that after having been grafted, one season's growth has taken place. In the winter cut down the shoot to three buds; two of the latter should be about twelve inches above ground, for the shoots from them will eventually form the primary horizontal branches. The shoot from the third bud is trained upwards to form the leader. Allow the shoots from the two side-buds to grow in an oblique direction until well on in summer, and bring them down to a horizontal position later. They naturally grow more vigorously in the

former position. Next winter the upright leader is pruned to three buds, exactly as the maiden shoot the previous season. The two side-buds should again be about twelve inches above the primary horizontal branches. Thus from these buds two more horizontal shoots will again develop, and from the third one, an upright shoot for the leader will be formed. This practice is repeated until the tree has attained the desired height. In order to strengthen the horizontal branches, the growth made every summer should be slightly shortened the following winter. Laterals will develop from them, and until the tree has become established, say for two seasons, they may be allowed to grow freely during the summer, so as to render the branches as vigorous



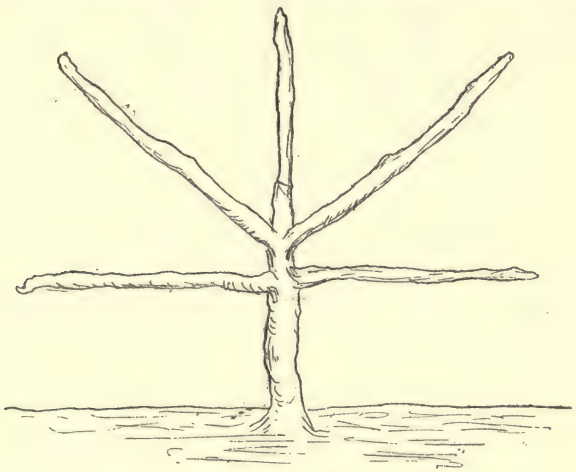
PEAR. FIRST BRANCHES OF FAN-TRAINED TREE. (See text.)

as possible. Allow each branch to grow in a slanting direction during summer, and bring them down at right angles to the stem in the autumn. When the tree is well established, instead of allowing the laterals to fully develop, pinch them back to five or six leaves in summer, and in winter prune them to three buds, so as to induce the formation of artificial fruit spurs, if there is room for them; if not, cut out the shoots altogether.

Fan-trained Trees.—The formation of a fan-trained tree is equally simple: Cut the maiden shoot down to three buds, exactly as advised for a horizontally trained tree. The resulting growths from the two side-buds may be treated as in the last-mentioned form, for they will constitute the two lowest branches. The leading shoot, however, must be cut back to three good buds somewhere near to its base. After shoots

have grown from these the following summer, in winter each one is also pruned back in the same manner. Thus, at the end of the third season there would be nine branches in all. In the winter, after their season of growth, the various branches should be brought down and secured several inches above the branch immediately beneath. Thus it will be seen that the tree in time assumes somewhat the shape of a fan; hence the name of this particular method of training. The branches as they extend will, of course, leave a larger space between them, necessitating the production of more of the former to properly cover the wall. These may be easily produced by shortening back one or more branches to buds situated where it is desired that new branches shall originate.

Cordons.—Cordon Pear trees are strongly recommended for a small

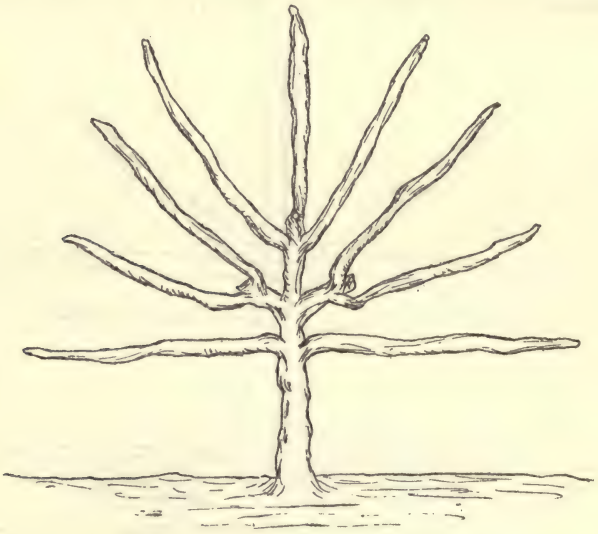


PEAR. FAN-SHAPED, SECOND YEAR

grower. They cover a wall very quickly, usually bear a good crop of fruit, and are easily managed. Cordons are known as single, double, treble, &c., according to the number of stems; they may either be trained in an upright or slanting direction. If the wall to be covered is a low one, the latter method is to be recommended, for then the Pear tree would be able to grow to a greater length than if trained perpendicularly. When it becomes necessary to restrict them considerably by severe pruning, canker is liable to set in, and some of the branches probably die away. Double or treble-stemmed Cordons are preferable for a low wall, as the trees are able then to extend farther and grow more freely. The various stems should be not less than twelve inches apart; in planting Cordons with several stems this, therefore, must be taken into consideration. As the stems extend, natural fruit spurs will doubtless form. Lateral shoots must be stopped exactly as advised before,

i.e. in summer five or six leaves, and pruned in winter to three buds. When this practice is followed and care is taken that the spurs do not crowd each other so as to exclude the sun and air, a fruitful tree will invariably result.

Pruning the Spurs.—It is sometimes necessary to prune the spurs, so as to keep them near the wall. In time they get so far away as to derive no benefit from its warmth and shelter, and must therefore be shortened. Upon fruit spurs there are two kinds of buds—plump, oval-shaped ones, the blossom-buds; and thin, elongated ones known as "spur-buds." These produce leaves only, and if, as sometimes happens, the spurs of a Pear tree have numerous spur-buds and comparatively few



PEAR. FAN-SHAPED, THIRD YEAR

flower-buds, the best practice is to thin out at the winter pruning or severely shorten back those spurs on the upper part of the tree, and to treat those in the middle and lower branches more leniently. The object of so doing is to equalise the distribution of the sap—for the lower portion of the tree is invariably the weaker—a condition that tends to decrease the number of barren and useless spurs by promoting the formation of flower-buds.

Root-pruning.—This sometimes necessary and beneficial operation is fully explained in the chapter on the Apple; it is usually upon trees worked on the Pear stock that root-pruning is required. Instead of simply making a trench around the Pear tree to arrive at the offending roots, if the former be not very large it may be lifted altogether; and its roots, that will probably have found their way into the subsoil,

MUSCAT OF ALEXANDRIA GRAPE.

cut back and placed in a proper position nearer to the surface of the ground.

Thinning the Fruit.—If the spring is a favourable one, free from late frosts, more fruits "set" upon a Pear tree than the latter can properly bring to maturity. It is, therefore, necessary to remove some of them so that the remaining ones may reach a satisfactory size and develop a good flavour. The flowers of the Pear are borne in small bunches of six or eight, known as corymbs. All except one or two of these, when set, must be pinched off in thinning; it may be even necessary to remove some of the bunches altogether. Upon a healthy tree in a favourable season the flowers are extremely numerous; the branches are one mass of white from apex to base, so that to leave even one or two fruits in each corymb would be a mistake. Sharp frosts, when the flowers are open, mean that probably none, or very little, thinning will be required. It is a great mistake to allow a fruit tree to mature a very heavy crop of fruit, for the following year at least it will be almost barren. A far better practice is to leave a moderate quantity of fruit each year, so that the tree may not have to expend the whole of its energy in developing and maturing the former at the expense of forming wood and nourishing its buds for another season.

Gathering the Fruit.—The simplest way to learn when a Pear is in condition for gathering is to raise it gently until the fruit is almost on a level with the stalk. If ready to be removed it will part easily at the point where it leaves the spur. If the fruit, however, does not appear to separate at that point it should be left longer. Several Pears, notably Williams' Bon Chrétien, must be gathered before the above stage or they will be found quite soft inside and unfit for use. Flemish Beauty and Doyenné Bussoch are also of this class. The early Pears—Citron des Carmes, Doyenné d'Été, Clapp's Favourite, Jargonelle, &c., will not keep, and must be consumed almost as soon as gathered. Do not leave any fruits upon the trees after the first week in November, or they will be liable to sustain considerable damage from high winds. It is advisable, however, to let all late Pears remain out of doors as long as possible. Avoid squeezing the former when gathering them, for every bruise will become visible in the course of a few days, and lead to decay. If it is desired to have late Pears throughout the winter months a cool, regular temperature is essential, and the atmosphere of the fruit room also must be dry.

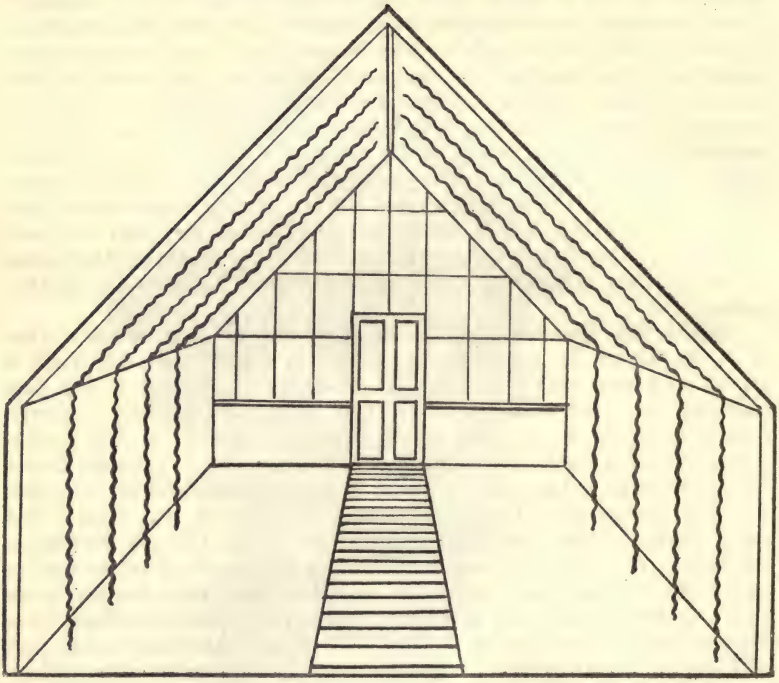
Specially-constructed rooms for storing fruit are usually fitted with shelves about two inches wide, and one inch apart. The fruit resting between these always has a free circulation of air around it. Examine the fruits from time to time, in order that all showing signs of decay may be at once removed.

The Vine.—It is surprising that a fruit so delicious and wholesome as the Grape should not be grown more freely by amateurs. In many a small greenhouse throughout the country excellent Grapes are annually produced.

The house in which the Vines are grown may either be span-roofed

or lean-to. The span-roofed structure is, however, decidedly preferable, for in a house of this design less space is wasted. It should be built with the ends facing north and south, as it then receives an equal amount of sunlight practically all over.

In early morning the eastern side would have the benefit of the sun, and the western side in the afternoon and evening; while with the sun high in the heavens, both would benefit equally. If the house were built to face east and west, the southern side would receive the



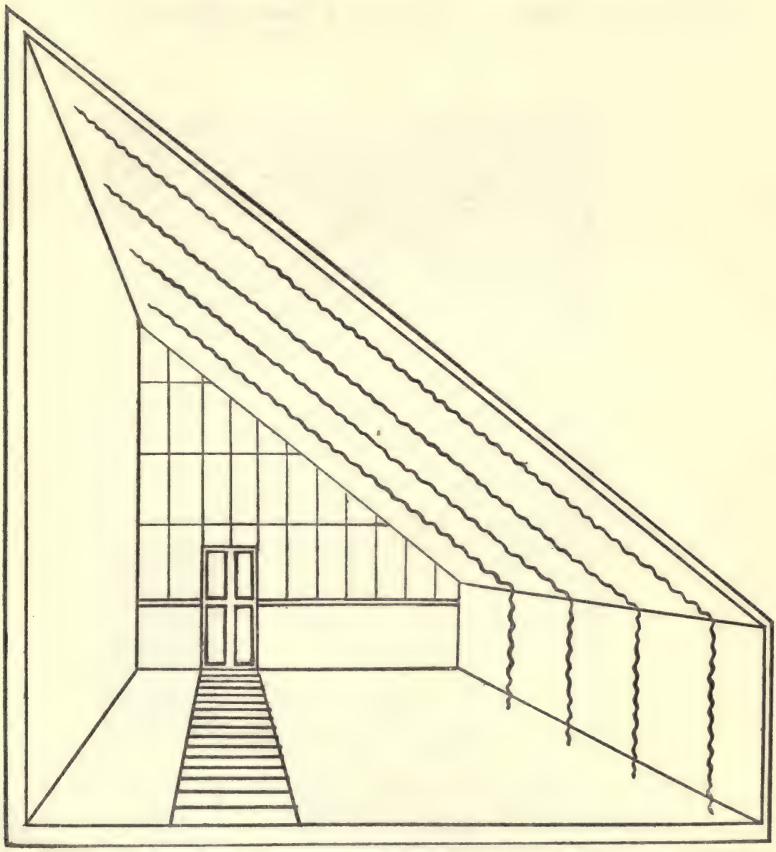
VINES IN SPAN-ROOFED HOUSE: ALL SPACE UTILISED

sun's rays almost the whole day, whereas the northern side would be scarcely touched by the sun at all.

Equally good Grapes can be grown in a lean-to vinery as in a span-roofed house, and if one desires to have Grapes early in the season, the former structure is suitable.

The Border.—Prepare a well-drained and suitable border, for if the material from which the roots derive nourishment for the support of the plant does not meet their requirements, the Vine cannot thrive. Whether the border be made inside or outside the vinery must largely depend upon circumstances. When the interior of the house is required for the accommodation of other plants the border must be

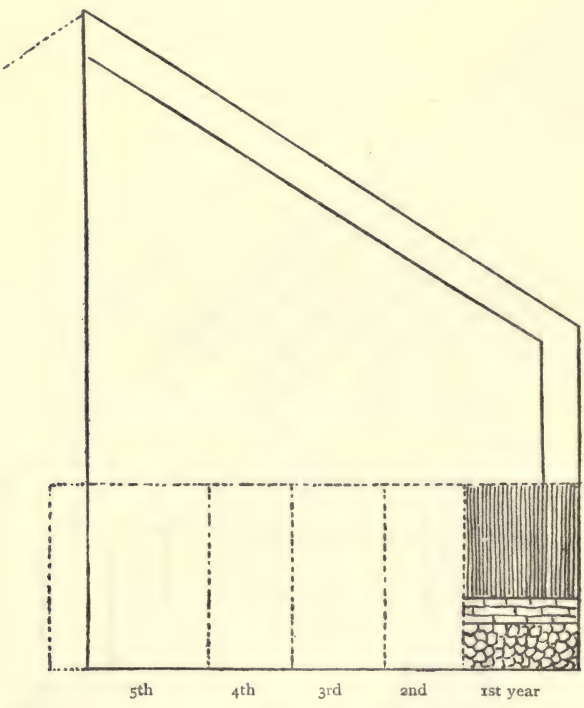
outside. For the cultivation of mid-season and late Vines no other need be wished for; if, however, it is desired to have forced Grapes in early spring, an inside border is preferable, because the temperature of the soil would be higher and more even than would that of an outside border, and so conduce to early root action and growth.



VINES IN LEAN-TO HOUSE: BACK WALL PRACTICALLY USELESS

The depth of the border should be three feet, and for the first year need not be more than four feet wide. It is a far better practice to make a small border when planting, and add a little fresh soil every year, than to at once construct a large border, that by the time it is full of roots will probably have become sour. If the subsoil is known to be heavy and close, small drain-pipes must be placed in the bottom, two or three feet apart, sloping towards the front of the vinery, if the

border be inside, and away from it if outside, and in each case be connected with a main drain. If, however, the subsoil is dry and gravelly, and therefore porous, drain-pipes are not required. Supposing these to have been placed in, if necessary, and carefully covered with large stones to prevent breakage; sufficient brick rubble should be placed over the bottom of the border to make a covering nine inches deep. This makes a splendid foundation for a Vine border, and affords excellent drainage.



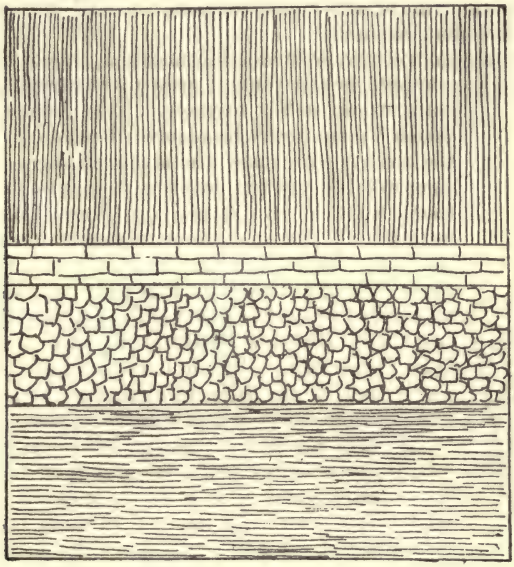
SECTION OF HALF SPAN-ROOFED HOUSE. WAY TO MAKE VINE BORDER, GRADUALLY ADDING NEW SOIL YEARLY

To prevent the soil from choking the drainage up, fill the remaining space chiefly with turfy loam—the coarser the better. If broken up into very small particles, it does not remain sweet and wholesome so long as when turves chopped into about four pieces are used, neither does it afford so attractive a rooting medium as coarse fibrous loam.

To insure annual crops of Grapes, mix other ingredients with the loam. Two of the most easily obtainable, and at the same time the most valuable, are wood ashes, and lime and brick rubble. The latter allows the water to pass freely through the border, thus

preventing the soil becoming sour through the presence of stagnant water. In a heavy, clayey soil, naturally more of this would be required than in a sandy one. Wood ashes are excellent for mixing in the soil of a Vine border; they contain a large amount of potash, proved by analysis to be one of the chief constituents of the Vine.

After a good sprinkling of some trustworthy artificial manure, the whole of the above ingredients must be well turned over, and thoroughly mixed together. Then place sufficient of the prepared compost over the turves to make the border of the required height, making it quite



SECTION OF VINE BORDER

A, prepared soil; B, turves; C, drainage; D, subsoil

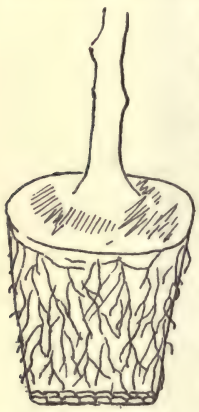
firm as it is put in by well treading it down. Finally, give a good soaking of water, and allow a day or two to elapse before planting.

Planting.—Vines are best planted sometime during the summer, when they are growing freely. If possible, do not delay planting young Vines after June or July; they are then making roots freely, and will quickly take hold of the new soil. Until required for permanent planting, young Vines are usually cultivated in pots. Care is necessary when taking them out of the latter not to break or damage the roots. Take care that the hole made to receive the Vine is so large that there is a clear space of twelve inches around the roots. Remove the surface soil, disengage some of the roots that will have probably become matted together in the pot, remove the crocks, and spread out the former as

well as possible. If the mass of soil and roots be left intact, as taken from the pot, it is likely to become dry, and the roots also cannot push into the new soil when they are matted and twisted together. Arrange the roots, as far as possible, in different layers, placing them out carefully in a horizontal direction. After covering over one layer with soil, make this firm before placing on the next. The uppermost roots may easily be kept back until required by turning them upwards to the stem; keep them down by means of pieces of turf.

Do not plant the Vines (supposing the border to be inside) within eighteen inches of the hot-water pipes, and, if planted outside, place them as near to the wall of the vinery as possible. It is a mistake to have much of the stem exposed.

During cold weather, straw, or some other material, should be put over the base of the stem outside, or the Vine, if growing or carrying a crop of fruit, would suffer severely. The distance apart at which Vines should be planted depends largely upon the variety (for some are much stronger in growth than others), and also whether it is intended to force them early in the season or allow them to start naturally. For the more vigorous ones, such as Alicante, Gros Guillaume, and Syrian, a space of three feet six inches or four feet between each is necessary, while Foster's Seedling, Black Hamburgh, and Lady Downe's Seedling, do not require more than three feet. When hard forcing is practised for a supply of early Grapes, the Vines will be wide enough apart at two feet six inches.



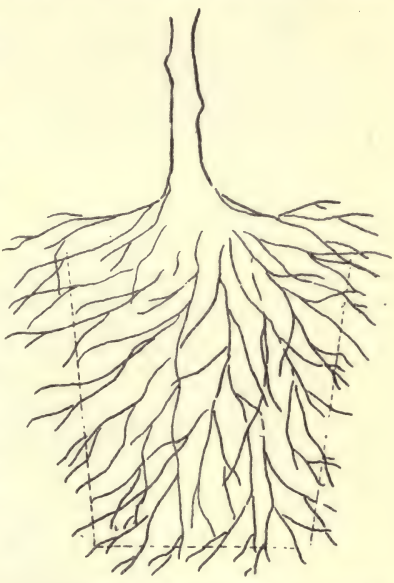
POT VINE AS IT APPEARS WHEN REMOVED FROM THE POT

Always make sure that the Vines are thoroughly well watered before being taken out of the pots. If dry when planted, it is difficult to water them properly afterwards. Instead of running through the hard mass of soil and roots, the water makes its way into the more porous border, leaving the former quite dry, although this perhaps may not be found out until the plant begins to suffer.

Treatment after Planting. — Encourage the Vines to grow vigorously, as that means they quickly become established. On sunny days the ventilators may be opened fairly wide—several inches both on the top and also at the front of the house. About three o'clock, however, they should be altogether closed. The temperature of the vinery will then naturally increase, and if, at the same time, the Vines are syringed and the walls and floors moistened, a genial atmosphere most favourable to growth will result. Towards the end of summer the wood of the Vine begins to turn a yellowish-white. This is a sign that growth has practically ceased, and that the ripening or maturation of the wood has begun. It is clear, therefore, that to still maintain a warm, moist atmosphere—so conducive to growth—would be useless. More air and less heat and moisture should now be given gradually, until in a few weeks' time the vinery is kept completely cool, the ventilators being

left open night and day. By the month of December the wood will have thoroughly ripened, the leaves have fallen, and the buds in the axils of them have fully developed.

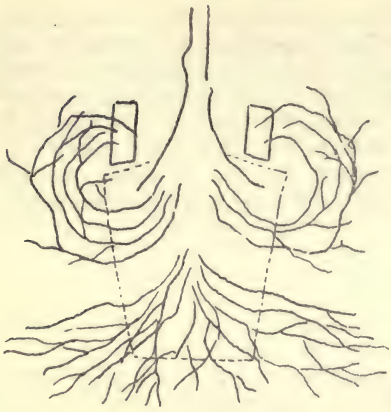
At this period it is necessary, strange though it may seem, to cut down the Vine cane—that probably has reached half-way up the roof of the house—to within two good buds of its base, *i.e.* usually about two or three inches above ground. The object of this operation is to establish the Vine well before allowing it to bear fruit, and also to enable it to form a good, strong stem. It is evident that if the first year's cane were left half or the whole of its length, and the following year side shoots were allowed to develop, both the former and the latter would be very weak. Keep the vinery quite cool until the first week in April, when it may be closed. No fire heat is necessary, except in very cold weather.



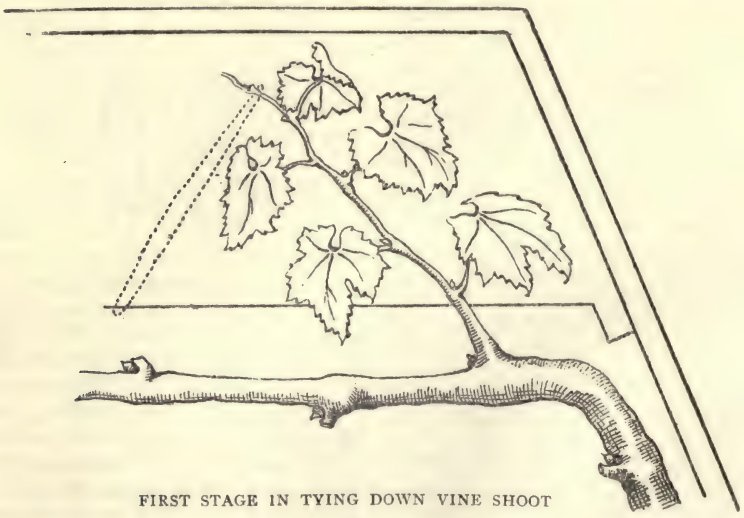
POT VINE. AS IT SHOULD BE PREPARED FOR PLANTING

A night temperature of 50 degrees is sufficient for the first few weeks. When the thermometer registers 65 degrees during the day the top ventilators should be opened two or three inches, and if the sun continues to shine more air, both at the top and front of the vinery, must be given in the course of an hour or so. Syringe the pathways and walks of the house occasionally, especially when the ventilators are closed in the afternoon. The thermometer then may register as high as 80 degrees without any danger. Taking advantage of the heat of the sun in this way lessens the need of so much fire heat, and is far better for the Vines. A house that is thus thoroughly warmed by the sun will not fall below 50 degrees during the night unless it is exceptionally cold outside. In a month's time from closing the vinery increase the night temperature to 55 degrees, and a few weeks afterwards to 60 degrees, at which it may remain throughout the growing season. Cut back to one leaf all side shoots that make their appearance during summer, so that every opportunity of making good growth may be given to the main rod. When in early autumn signs of ripening are noticeable in the wood more air must be given and less moisture, as before advised. It will thus be seen that during the first two seasons after planting the Vine is not at all difficult to manage. It may thus be summarised:—During the growing season, from April to August, provide a warm, moist atmosphere, and be careful to see that the border is

well watered whenever the soil appears dry. When the wood begins to ripen gradually decrease the moisture and heat, and increase the amount of air, until finally the ventilators are kept open night and day. The border must not be allowed to become dry during winter, for the roots of the Vine are alive and require nourishment. Naturally they will not absorb so much water as when the Vines were in full leaf, but to let the soil of the border get quite dry is fatal. In the winter following, if the Vine has grown vigorously and become, say, as thick as one's thumb, the cane may be left about four feet long. If, however, it is somewhat weak, shorten it again. Presuming, however, that the Vine has succeeded well enough to be left four feet long at the second winter pruning the cultivator may expect to have two or three bunches of Grapes the following summer. The apex of the young cane will now reach some little distance along the



VINE. SHOWING METHOD OF PLANTING

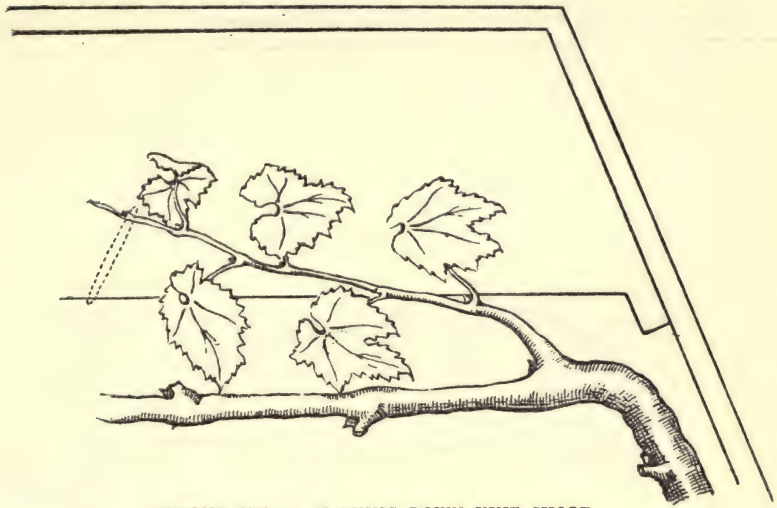


FIRST STAGE IN TYING DOWN VINE SHOOT

wire trellis suspended about eighteen inches away from the roof. Rub off all the buds upon the stem of the young Vine, beginning with the lowest, to within the two below the trellis, for if shoots were allowed to

grow from them they would never be of use on account of the nearness of the hot-water pipes and the absence of light. Give exactly the same conditions and temperatures as were afforded the two previous seasons, and the remaining buds will soon push forth. The one near to the apex of the Vine must be trained towards the top of the vinery to form the leader, and those that push from the other buds are trained horizontally. These horizontal shoots must not be closer than about fifteen inches, so that it will probably be necessary to remove some of them. In doing this endeavour to leave the shoots, so that those on the one side alternate with those on the other.

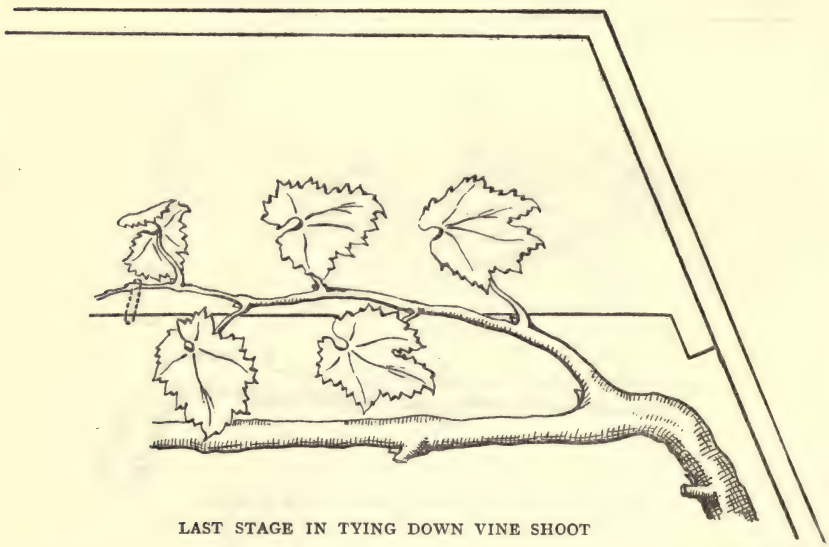
When the tender young shoots have almost reached the roof tie them down to the trellis so as to keep them from being scorched or



SECOND STAGE IN TYING DOWN VINE SHOOT

injured by cold, and also train them in the required direction. This work requires care, for the young growths break off easily at the base. Place a piece of matting (raffia) over the shoot, about three inches away from its apex, and draw it gently away from the roof. Tie the other end of the matting to the trellis. Do not make a double knot, for in the course of a few days the matting can be drawn considerably tighter, sufficiently so perhaps to bring the shoot half way down between the trellis and roof. After several days have elapsed it will bend easily to the trellis, and may then be finally tied. Soon afterwards laterals will develop from the shoot cut back, or these also must be stopped when they have made two or three leaves. Some of the side shoots are almost certain to bear bunches; but all the latter, except two or three, should be removed, as to allow the Vine to carry a heavy crop of fruit at so early a stage of its existence would be unwise.

Encourage the Vine to grow freely by keeping the house warm and moist, and giving the same temperatures as previously mentioned. When, however, the Vines come into flower a drier atmosphere is required, so that the pollen from the stamens of the flowers may be easily dispersed. If the pollen becomes damp through too much moisture in the vinery, it is naturally not so easily dispersed as when perfectly dry, and in this case imperfect fertilisation would ensue, or, as it is popularly expressed, the Grapes fail to "set" well. The necessity for a drier atmosphere and more air is therefore easily apparent. It is an excellent plan to gently shake the Vines every day when they are in flower. In the course of a few days if fertilisation be effected (and most varieties of Grapes set easily if the above conditions are afforded)



LAST STAGE IN TYING DOWN VINE SHOOT

the berries begin to increase in size quickly. When this is noticeable keep the house warm and moist again to assist the Grapes to swell as rapidly as possible.

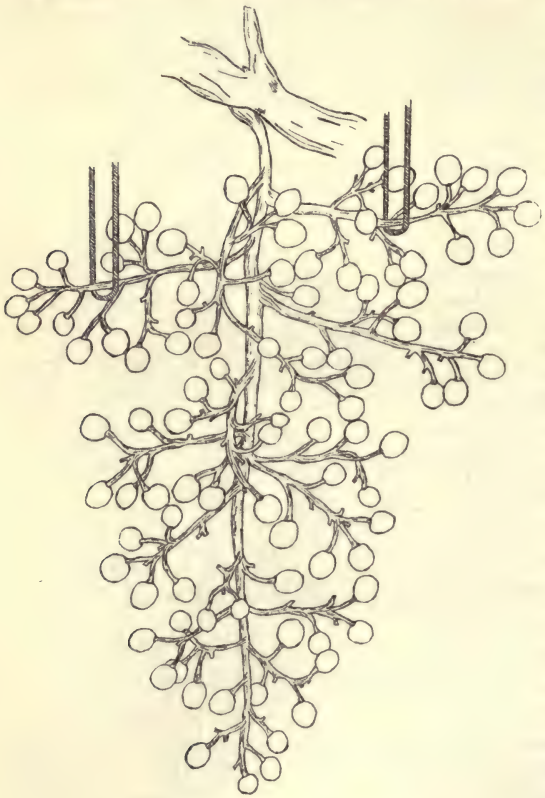
When the berries have become almost as large as peas remove a great many of them ("thinning" is the technical term for this work) so as to allow the remaining ones sufficient space for development. A pair of Grape scissors, with long tapering points, and a small forked stick, about nine inches long, are required. In thinning, hold the stem of the bunch by means of the forked stick with the left hand, and cut away the superfluous berries with the scissors in the right hand. Commence at the bottom of the bunch, and remove first the small seedless berries, then most of those inside, and finally the necessary number of the remaining ones. It is impossible to say how many berries should

be removed, but taking, for example, the well-known variety, Black Hamburgh, in a properly thinned bunch about half the berries will have been cut away. These, when finally thinned, should be about half an inch apart. Keep in view the shape of the bunch, and endeavour to equally regulate the distance between the berries. Always leave a good number upon the uppermost shoulders, which must be looped to the trellis above with a piece of matting if they droop down. It is necessary to look over the bunches in the course of two or three weeks, for some of the berries may have been left too thickly when first thinned. When four leaves have developed beyond the bunch of Grapes, pinch back the shoot to within two or three leaves of the bunch, according to the amount of space at disposal. Sometimes the bunch originates nearer the base of the shoot than at other times, thus allowing space for leaves beyond.

VINE. AN UNTHINNED BUNCH

As the berries are swelling freely, a night temperature of 65 degrees should be maintained, and little fire heat is necessary in early summer. In a few weeks' time, it will be noticed that the berries have apparently ceased to swell. What is known as the stoning period has arrived, and for about a fortnight, or rather more, no material difference is visible in the size of the berries. The reason is that the energies of the Vine are then directed towards the development of the seeds. On no account allow a high temperature to prevail at this period, for the berries cannot then be forced to swell, and injury might easily result. It is not difficult to discern when the stoning period is over, for the berries again quickly increase in size, and continue to do so for several weeks. Still close the house early in the afternoon, and moisten the walls, &c., to create a warm, genial atmosphere. A considerable quantity of water is now required. The border must not become dry, or a check to the plant and its fruit results. Liquid manure water is beneficial at this period. Before many weeks have passed, some of the bunches will begin to change colour. At first they are tinged with light-red, become reddish

black, and finally black. As soon as signs of colouring are noticed, sprinkle a little water about the house, and give more air. After several days when the change in colour becomes general, increase the amount of air, and also leave the ventilators slightly open at night. Discontinue to moisten the walls, paths, &c. In a few weeks' time the vinery may be thrown quite open during the day, and partially so at night, until the fruit is cut. Then keep it quite cool. Do not diminish the fire heat at all until the Grapes are well coloured, and even when they are ripe, a little heat should still be maintained so as to avoid damp upon the bunches.



BUNCH PROPERLY THINNED

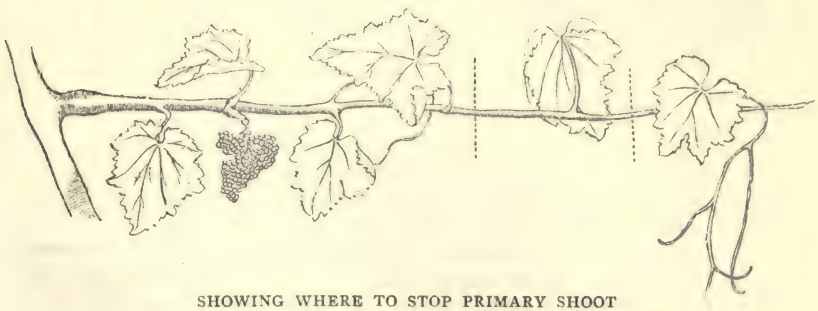
Pruning. — This is an important operation in the culture of the Vine. The system in almost universal practice in this country, and undoubtedly the best and most convenient, is that known as spur pruning. Let us take as an illustration a young Vine that has made three seasons' growth, the one we have hitherto considered. At the end of the first season after being planted, it will be remembered that the Vine rod was cut back to two eyes, the next year left four feet long, and the following spring horizontal shoots were allowed to develop from the higher portion of this, and the leader was trained up the trellis towards the roof of the vinery. At the third winter pruning leave this leading shoot two or three feet longer than it was at the beginning of the year; it will now therefore be about seven feet in length. The horizontal shoots are to form permanent fruit spurs. Shorten them back to within one or two buds of the base; to one, if the basal bud is well de-

veloped and hard, and to two if the lowest is not a good one. The same principle applies here as when the young Vine was cut down at the end of the first year after planting. If the shoot under consideration were left at full length it would be weak and useless. By pruning the shoots that have grown from the spurs during summer to the one or two lowest buds every winter the Vine is kept within proper bounds, and may be cultivated for many years in a comparatively small space. Do not leave more than two buds at the annual December pruning, and two only when the last one is not well developed. If the shoot is left an inch or more in length every winter, the spur soon becomes long, unsightly, and weak. Until the leading shoot reaches the top of the vinery, it may be cut back at the end of each season to within about three feet of where it commenced to grow the previous spring.

VINE. WINTER PRUNING

Dotted lines = where to cut back to.

Watering.—Watering must not be overlooked. From the time the berries commence to swell until the Grapes are ripe, an abundance of



SHOWING WHERE TO STOP PRIMARY SHOOT

Two or three leaves beyond the bunch. Dotted lines denote where to cut.

water is necessary. The border should never be allowed to become dry. After the first mentioned period give stimulants occasionally, either in the form of artificial manure, sprinkled in the border, and slightly forked in before watering, or of liquid farmyard manure. It is important not to allow the Vines to suffer from want of water after the fruit is cut, for then the buds are being matured for another season's growth. Water

is hardly needed from after pruning until the Vines have been started several weeks.

Varieties.—Undoubtedly the best of all Grapes for the amateur is—*Black Hamburgh*, unless very late Grapes are required. This variety may be ripened by the month of May, and also throughout the summer until October and November. It has an excellent constitution, bears well, sets freely, and the fruit ripens quickly.

Foster's Seedling—a white Grape—is almost, if not equally as good. It also may be had in perfection in May, and, like Black Hamburgh, has a good constitution. The berries are yellowish-white, and very sweet. It makes an excellent companion for Black Hamburgh. These two Grapes are certainly the most satisfactory for an amateur grower.

Black Alicante may be next recommended. This is a late Grape of good flavour, and may be had from October to March.

DEVELOPMENT OF LATERALS. STOP AT DOTTED LINES

Gros Colman is a large, black, late Grape, of a peculiar and distinct flavour, largely grown for the London market. It requires more heat than the above varieties to properly ripen.

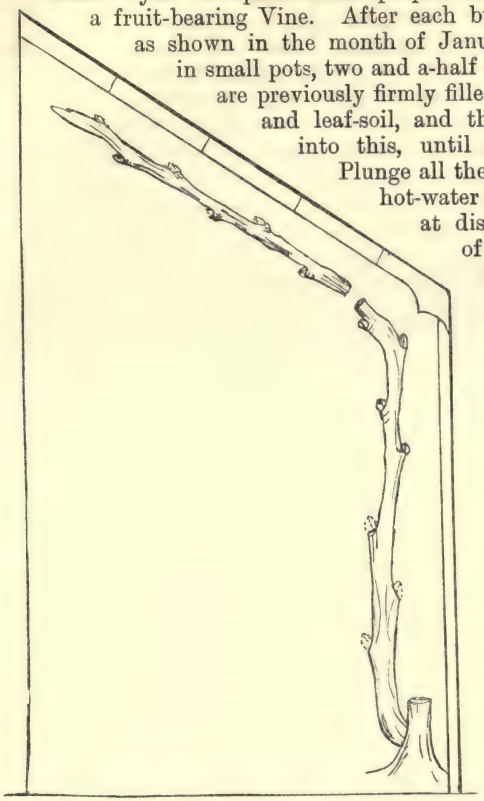
Madresfield Court and *Muscat of Alexandria* are two splendid Grapes, but require rather a higher temperature to insure success than the two varieties first named.

Lady Downe's Seedling is a delicious late Grape, that keeps until late in spring; it has not, however, a vigorous constitution.

Alicante is the best late Grape for a small grower. Some varieties produce very large bunches, though usually not more than three or four are produced upon a Vine. These are Gros Guillaume (black), Syrian, and Raisin de Calabre (white).

Propagation.—The usual way of increasing the Vine is by means of "eyes," taken in winter. The term "eye" denotes a cut portion of the

previous summer's ripened wood, containing a bud. It is about an inch long, being cut close to the bud on both sides. Each of these "eyes" is capable under proper treatment of developing into a fruit-bearing Vine. After each bud or "eye" has been cut as shown in the month of January they are placed singly in small pots, two and a-half inches in diameter. These are previously firmly filled with a mixture of loam and leaf-soil, and the "eye" is then pressed into this, until only the bud is visible. Plunge all the pots in fibre or sand over hot-water pipes in the warmest house at disposal, or a small hot-bed of manure might be made. Syringe them several times a day, and shade when the weather is bright. The buds in a week or two will commence to burst. The soil hardly needs water for two or three weeks after the bud has burst into growth, for comparatively few roots are formed; until then keep the tiny plants in a position near the glass so that they may have plenty of light and sun, and they will soon increase in size and vigour.



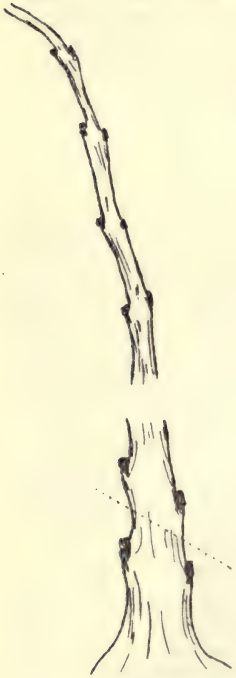
YOUNG VINE AFTER SECOND YEAR'S GROWTH. WAY TO PRUNE BACK

Herbaceous Grafting, that is, the uniting of two growing shoots, and Inarching, are two useful operations, well worth knowing how to perform. If, for instance, two Vines are growing side by side, one of which is worthless, a shoot from the one that is of value may be grafted upon the worthless one, and the branches of the latter eventually cut down. The operation is very simple: Choose two shoots that can easily be brought together. With a sharp knife cut a small piece from the side of each, and fasten the cut portions together, so that on one side at least the outer edges of both correspond. Bind them together firmly with matting, and then cover this thinly with clay to prevent the access of air to the parts to be united. In a month or two the union will probably be effected. The

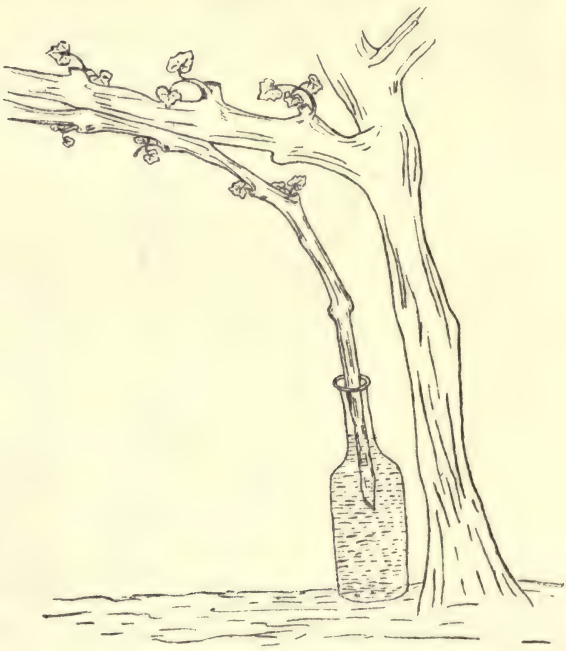
VINE EYE

shoot of the worthless one should then be cut back just above the graft, and when the grafted shoot has become thoroughly established, it may be severed from its parent, and the worthless Vine completely cut away, except, of course, that portion below the graft.

Inarching, or Grafting by approach, consists in uniting two Vines together by treating them exactly as in herbaceous grafting. The operation, however, is performed just as the Vines commence to grow, and the matured wood of each, instead of the green, is joined together. A pot Vine may easily be inarched upon a permanent Vine planted out, if



VINE. ONE YEAR OLD. PRUNE TO DOTTED LINES



VINE. BOTTLE GRAFTING

brought close to the stem of the latter, and attached to it as above explained.

Bottle Grafting is also a simple and convenient method of propagation. The shoot to be grafted is cut from the Vine the previous autumn, and kept half buried in soil in a cold-house, until the Vine upon which it is to be placed has just commenced to grow. Then bring the graft into the vinery for a few days before grafting, so that it may be brought into practically the same condition as the stock, *i.e.* the permanent Vine. Place one end of the graft into a bottle of water,

and attach the other end to the stock by the method previously described, finally covering over with matting and clay. Sufficient nourishment is contained in the rain water of the bottle to sustain the graft until it has become united with the stock. Do not remove the bottle and covering until the grafted shoot has grown several feet long.

Vines are largely grown in pots by nurserymen to provide a supply for early forcing, and for replacing old Vines and planting new vineries. A small grower cannot do better than buy good, strong pot Vines for planting out; it is far more satisfactory than attempting to cultivate them oneself. Great heat is necessary, both above and below, to have them of sufficient size and vigour in one season.

Insect Pests.—There are several troublesome pests that attack the Vine, and a season seldom passes without one or more making their appearance. Mildew, a white fungus that attacks the leaves and also the young bunches, is one of the most common, and, if not checked, quickly disfigures a whole house of Vines. The spores of this fungus cannot germinate in a warm, dry atmosphere; moisture is necessary for this. It is, therefore, evident that the latter condition must be avoided, and the vinery kept warm and dry for a few days. Flowers of sulphur dusted on the berries and all affected parts is an excellent remedy.

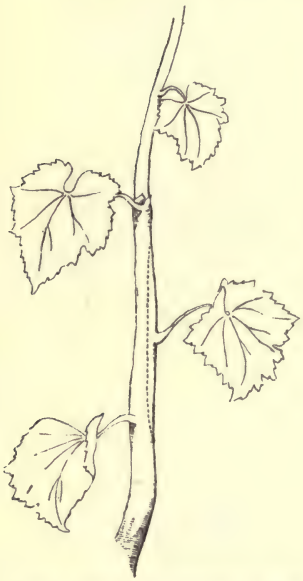
VINE EYE IN POT WITH BUD JUST SHOWING

The red spider is a minute insect that often attacks the foliage, and, if left alone, would soon destroy it. It always appears to attack the lower surface of the leaves, which have a yellow, unhealthy appearance. A hot and dry air favours this pest; it is often more prevalent near the hot-water pipes. Endeavour, therefore, to maintain a moist atmosphere until it is checked. Syringe the Vines well with clear water daily, and occasionally with a solution of soft soap and warm water.

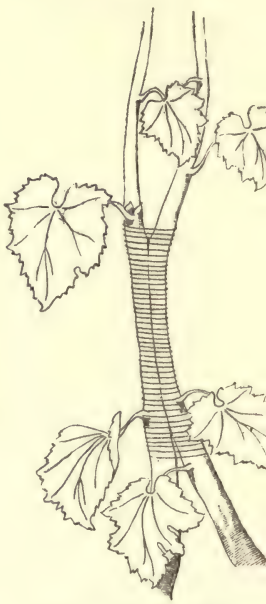
Mealy bug when once established in a vinery is difficult to eradicate. The most effective remedy is to throw a good handful of sulphur upon a few pieces of hot coke placed in a flower-pot, and allow the fumes to fill the vinery. This must only be done in midwinter, when the Vines are perfectly dormant, and no plant in a green state must, of course, be left in the house, or even in an adjoining one, for sulphur fumes are deadly to vegetation. When the Vines are started in the spring, a look-out must be kept for this insect, and a short time spent each day in going over the Vines with a small brush and a little paraffin. This will kill mealy bug instantly, but the buds of the Vine must not be touched, otherwise they will be injured.

Vine Culture in the Open Air.—Excellent Grapes may be grown out of doors, but their growth must not be neglected. East Anglia is one of the

parts of England that has always been noted for its open-air Vines, and cottagers sometimes make good sums of money by the sale of Grapes from their walls. The Vines generally cover the roof, as well as the front of the cottage, being supported by a wooden framework, about fifteen inches from the roof. Vines delight in abundance of sunshine, and should be planted against a wall facing south. A border must be prepared, but this is quite easy, as it need not be more than two and a-half feet deep and three feet in width. A border of these dimensions, if composed of good holding heavy soil, with a little bone meal and a liberal quantity of old mortar rubble added, will support Vines for many years, provided



TWO GROWING SHOOTS TO BE GRAFTED. DOTTED LINES SHOW WHERE TO CUT



THE SHOOTS JOINED TOGETHER

the roots are well mulched with short manure, and assisted with liquid or artificial manure when the berries are swelling.

Rich borders encourage a strong sappy growth, which does not ripen properly, and invariably gets crippled in winter. With regard to drainage, if the ground is naturally porous, nothing more than spreading six or eight inches of broken bricks or clinkers in the bottom will be necessary, but if the subsoil is at all retentive, a drain pipe, three inches in diameter, must be put down in a slanting direction to carry away superfluous water. Cover the drainage with turf, grass side downwards, to prevent the soil from blocking it, and this must be made firm by treading or ramming. Obtain moderately

strong well-ripened Vines in small pots from a good firm in January. Prune them back to within fifteen inches of their base, and keep them dry and cool until the end of March, when they may be planted. Turn the Vines out of the pots, remove the crocks from the base of the balls, loosen the roots a little with a pointed stick, and plant, covering the roots with three inches of soil, and ram it firmly. When planting against a bare wall, place the Vine in the centre, and train a rod horizontally to the left, and another to the right, some two feet or so from the ground—these to furnish the main bearing rods—to be trained in an upright direction, three feet apart, the second and following years, until the wall is furnished. When planting against a dwelling-house, place the Vine in the most convenient position, and train the main rods over all available spaces, three feet apart. The Vine must either be nailed to the wall or tied to wires.

General Remarks.—As a rule, February is the best month for pruning open-air Vines, and the main growths should be pruned back into the well-ripened wood. When the Vines commence to grow, the young fruit-bearing shoots on each side of the rods must be thinned out, and evenly disposed eighteen inches apart. If left thicker, sun and air will be excluded, and both foliage and fruit will be small and inferior. The fruiting laterals must be pinched at two leaves from the bunch, re-pinched when another leaf is made, and not allowed to make further growth.

When the berries are set, and are as large as No. 3 shot, they should be thinned with Grape scissors. Remove most of the inside berries, as they seldom colour properly, and thin out the rest, so that when the ripe bunch is cut and laid on a dish it will not lose its shape. When the Grapes are swelling, well water the roots once a week with liquid manure, the colour of pale ale, or sprinkle a little artificial manure on the surface and water it in. The foliage should also be freely syringed occasionally on fine evenings to ward off red spider. Mulch the border in June with short manure to keep it moist. Wasps and flies often attack open-air Grapes when ripening, and the best way to protect them is to envelop the bunches in muslin bags. Wasps may also be trapped by half filling soda-water bottles with sugar and beer, and laying them on the Vines. Each year when the Vines are pruned, a little of the old soil should be removed from the border, and replaced with fresh sweet compost.

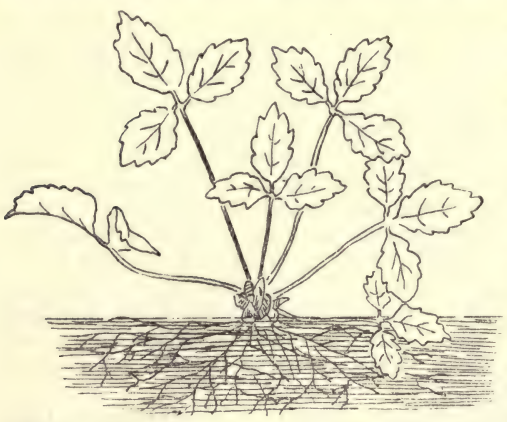
The best Grapes for open-air culture are—Black Cluster, Cambridge Botanic Gardens, a very sweet purple Grape; Miller's Burgundy, Old White Sweet Water, Royal Muscadine, and Chasselas Vibert, a delicious Grape. The Vine, apart from its fruits, is valuable for its picturesque growth. Many a sunny corner may be well clothed with its beautiful foliage and in the autumn sweet fruit clusters, and Vines are as appropriate as any wall plant for the old-world English homes now built in many parts. A cottage or English home of the past was seldom without its clustering Vine.

The Strawberry.—This is one of the most delicious of hardy fruits, and gives its precious harvest in June and July. The Strawberry

should be cultivated by those with merely a small plot of ground; it needs neither pruning nor training and quickly fruits. This cannot be written of Apple, Pear, Plum, &c., that never reach full fruit-bearing condition until several years have elapsed.

Soil and Situation.—In ordinary garden soil the Strawberry succeeds; it delights, however, in a deep loam, well enriched with manure. As in the case of most other fruit-bearing plants, it does not thrive so well upon light, gravelly land. The ground upon which it is intended to make a plantation of Strawberries should, towards the end of July, be dug over deeply, at the same time placing a layer of manure in the bottom of each trench as the work proceeds. This will prove especially valuable to the roots if the soil be of a light nature. Strawberries grow well in almost any position in the garden; they may be planted upon open ground fully exposed, or upon borders facing north, south, or west. Planted on a north border late varieties are very useful, for they provide a supply of fruit for a considerable time after the general crop has been gathered. Upon a south border, especially with a wall behind, ripe fruit may be gathered from the early varieties by the first week in June, or even before, much depending upon the weather.

Planting.—August is the best month to plant the Strawberry; early planting is one of the chief points in its culture. The plants are then able to get well established in their new quarters before the winter, and so pass safely through the cold, inclement weather; whereas if planting is deferred, say, until late in September, winter is at hand before the roots have penetrated into the fresh soil. When brighter and longer days appear they are not in a fit condition to take advantage of the change. Consequently they are late in commencing to grow, and when the flower spikes do appear they are so weak and small that one can safely predict that the first season's crop will be useless. Such is the effect of planting too late.



SHOWING HOW TO PLANT A STRAWBERRY. CROWN JUST ABOVE SURFACE OF SOIL

After a Strawberry plant has borne fruit for three, or, upon good land, for four seasons, a fresh plantation must be made, as from this time deterioration sets in. In large gardens Strawberries are frequently not kept more than two years. Place the Strawberries twelve

BASKETS OF ROYAL SOVEREIGN STRAWBERRY.

inches from each other, in rows two feet apart. Choose, if possible, a dull day for planting, and when the ground is moist; the plants then get a good root-hold more quickly than when the soil is hard and dry. If the summer has been very hot, and no rain has fallen for some time, well water the ground before and after planting, and also for a few weeks, until the plants have made fresh roots. Of course, if rain falls, this will be unnecessary. Make sure that the Strawberry plants are watered before being placed in the ground. When water is given after planting in a dry soil it will run down by the side of the hard dry ball, and enter the more easily penetrated ground immediately around, thus leaving the plant as dry as before. Much of the after success of the Strawberry depends upon the way in which it is placed in the soil. The roots should be just covered and quite firm; the crown (*i.e.* the point from where the young leaves arise) must, however, be quite free and exposed. If this were covered with soil, and the latter became wet, the leaves would probably decay and death result. If, on the other hand, the crown were too far out of the ground, the plant would become so loose, by being shaken by the wind, that it would never obtain a proper hold of the soil. First make a hole with a trowel, at the spot already marked out, sufficiently large to comfortably receive the roots when spread out as they should be; then insert the plant, cover with soil, and with the foot tread firmly all round, taking care not to touch the plant itself.

After Treatment.—After planting place a mulch of well-decayed manure around the Strawberry plants. If the autumn is hot and dry the manure will keep the ground moist and cool, and the formation of new roots thereby greatly assisted. The manurial properties will also be washed down into the soil by rain. On the first appearance of weeds in spring at once run the hoe between the plants. In the month of May a covering of clean straw should be placed between and around the plants to keep the fruit clean and uninjured. Strawberry fruits that are allowed to remain in contact with the surface of the ground become splashed with soil during rain, and are then almost worthless. The straw also serves to protect the flowers from slight frost; it is a simple matter to shake it out a little with a fork at night so as to cover them over. If there are signs of sharp frost when the flowers are open improvise some covering without delay, otherwise the crop of fruit will be partially destroyed. Straw, old mats, or canvas are excellent. Unless it be desired to increase the stock of Strawberries, the side shoots, or runners as they are termed, should be cut off as soon as they appear. The swelling fruits will be greatly helped by the mulch that was spread over the ground the previous autumn, providing sufficient rain falls to wash its manurial properties to the roots. If not, water must be applied by hand. Do not gather the fruit when wet, especially when it is to travel some distance. After all the fruits have been gathered remove all decayed leaves from around the plants, cut away any runners that remain, and lightly fork the soil in between the rows, after having first removed the straw.

Propagation.—The way to increase the Strawberry is by runners.

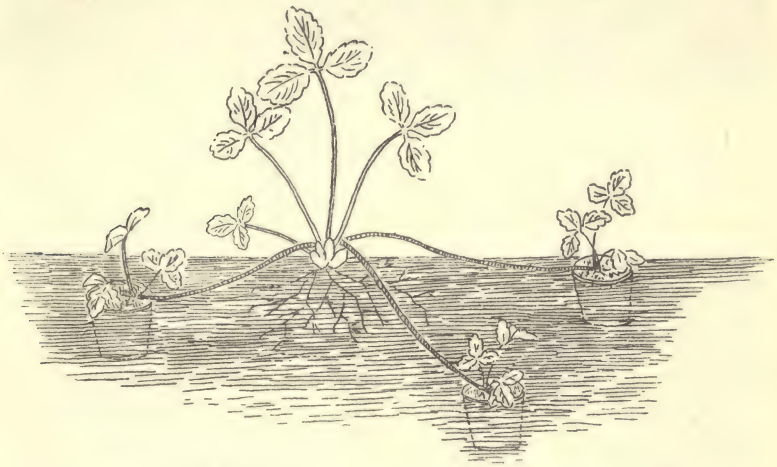
"A runner" is easily recognised. Examine a vigorous plant during the summer; it will be noticed that several long, thin, stalks we may call them, proceed from it at various points, and that at the end of each of these there is a tiny plant. This is a runner, and propagation is effected by these ("layering" the operation is called). One must so treat these small plants as to induce them to form roots. They are then severed from the parent plant. There are several ways of accomplishing this; the one most strongly recommended is that of layering the runners into small pots which should be about 2 inches in diameter, having a small piece of turf at their base for drainage, fill up with soil, from which the coarser particles have been sifted, then plunge them into the ground quite close to the parent plant. The object of placing the small pots in the ground is to prevent the soil from becoming dry, as would quickly occur were the sun able to reach them. The runner (the tiny plant at the end of the long stalk) is then fixed into the soil of the small pot. This is some-

STRAWBERRY PLANT WITH RUNNERS

times effected by means of a piece of wire bent ∩ shaped, but more generally by matting, looped round the long slender stalk, near to the tiny plant, and pressed into the soil with a pointed stick. Give them water whenever required—this may be even twice a day in bright weather—and in a week or so roots will be emitted, and quickly take possession of the soil in the pot. The long stalk may then be cut, thus severing all connection with the parent plant; for the runners are now established on their own roots, and well able to take care of themselves. They are now ready, either for planting out in the garden, as already described, or they may be again placed in larger pots and grown for forcing. The latter half of June is the best time to insert the layers in the small pots.

Cultivation in Pots.—Strawberries are cultivated in pots, so that they may be taken into a glasshouse in spring, for the purpose of compelling them to produce fruit earlier than those grown in the open garden. Such a method is known as forcing, and the fruits thus produced, as forced Strawberries. Strawberry-forcing is most interesting

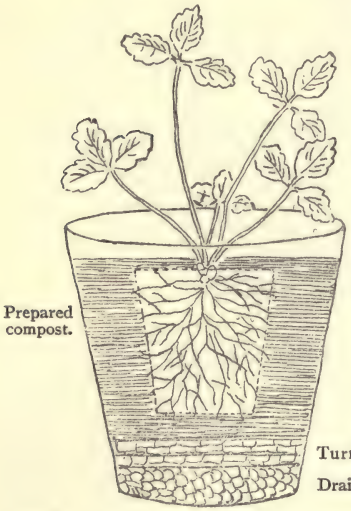
work, and should be attempted by all who wish to prolong the season of this delicious fruit. It is not necessary to have a large number of plants, and much fire heat is unnecessary, unless it is desired to have fruits very early; it is not, however, advisable for the small grower to attempt to force Strawberries very early, for a certain proportion of the plants become blind (*i.e.* they bear small, useless flowers, or perhaps none at all), and the flavour of the fruits in the dull weather of early spring is by no means first-rate. Delicious fruits may, however, be had in the month of April by gentle forcing. We will now go back to where the runner was left. It will be remembered that this was fixed into a small pot of soil and carefully watered. After having severed the rooted runners from the parent plants, in order to have plants that can be forced to bear fruit by the following April, transfer



SHOWING SAME RUNNERS WHEN LAYERED INTO SMALL POTS

the former to larger pots—those six inches in diameter are the most suitable. If the runners were layered towards the end of June, by the first week of August they will be sufficiently well rooted to remove. The nature of the soil in which they are now potted is of great importance, for it has to support them for about nine months. Nothing is better than rough, turfy soil, with which a little guano, or manure from an old mushroom-bed, and some small pieces of lime or brick rubble are well mixed. The latter help to keep the soil sweet and wholesome, while the guano stimulates and supports the plants. Place several crocks over the base of each six-inch pot for drainage, so that the water given to the plant may pass away freely. Unless proper drainage is provided, satisfactory results cannot be obtained. Over the crocks place a few rough pieces of turf to prevent the smaller particles of soil from falling into them, and thus stopping free

drainage. Then fill in as much of the prepared soil as will raise the uppermost roots of the runner within about an inch and a half of the rim of the six-inch pot and place the runner upon it. Holding the small plant firmly with the left hand, with the right hand fill the surrounding space between it and the side of the pot with the prepared compost. Make this quite firm with a wooden rammer. The latter should be nine or ten inches long, an inch or so in diameter, and made round; the base, however, should be quite flat. As soon as the space around the small plant has been filled in, add sufficient soil, made firm, to fill the pot to within about three-quarters of an inch of its rim. This margin is necessary to receive and hold water when this is applied. On removing the runners from the small pots, take care that the roots are not broken or bruised. When all the plants have been thus placed in six-inch pots, stand them for a few days in partial shade, syringing them several times daily, and give water whenever required. In a week's time place them upon an open piece of hard ground—the garden walk is an excellent position—so that they may have all the sun possible. Allow each plant plenty of room, by placing them in rows, nine or ten inches apart, and let each one be three or four inches from its neighbour. An abundance of water is required during the hot weather, when the plants are well rooted, and they must not be allowed to suffer from dryness, or bad results will follow. It is preferable to water them early in the morning or evening, as then the water thoroughly moistens the soil. It is probable, however, that water will be again required before the day is over. Syringe the plants every evening, so as to encourage growth. Cut off all runners that appear, and remove weeds when seen. When cold weather arrives, some protection must be afforded, or the roots might suffer, and the pots be broken. A simple method of preventing this is as follows:—



WAY TO PLACE THE RUNNERS, WHEN ROOTED, INTO A LARGER POT

First place the plants closely together in a straight line. Then spread a layer of bracken or ashes (the former is preferable, if it can be obtained) by the pots; place another row of plants next to the bracken, so that the latter is pressed quite closely between the two rows of plants. Continue this—a layer of bracken, and a row of plants alternately—until all are protected. The first row that was put down will also need covering on the outside until about the

middle of February, when no further attention is required. If ripe Strawberries are desired in April, the number of plants required must be placed under cover early in February.

Forcing.—A cold frame is the best position for three or four weeks. If a mild hot-bed of leaves can be prepared, in which to plunge the plants, so much the better, for this promotes root action. Under this treatment, the flower spikes also appear more quickly. In about eight weeks from placing the plants in the cold frame, ripe fruit may be expected, if a little fire heat be afterwards available. At the close of three weeks or so, when the flower spikes commence to push forth, the plants must be placed near to the roof (that is to say, within twelve or eighteen inches) of whatever structure is at hand. If none other than a cold frame is available, this will answer the purpose well, although the fruits will naturally not be ripe as soon as in a heated glasshouse. When the plants are first placed in the cold pit, if it is intended to remove them in a few weeks' time, they may be plunged close together. If, however, they are to remain there to fruit, a distance of several inches between each plant must be allowed. A mild hot-bed is of immense advantage for starting early Strawberries, for by first gently exciting the roots into action the plant is made to produce better foliage and stronger flower spikes. Syringe the plants daily once or more, according to the weather, giving a little air in the morning; close the pit early in the afternoon, and syringe the plants at the same time. When the flowers begin to open, keep the atmosphere of the house dry, and admit plenty of air; such conditions facilitate the formation of the embryo fruits, and must be maintained until these are properly formed. When six or seven fruits "set" upon each plant, the pit or house should again be kept warm and moist, to encourage the former to grow as quickly as possible. Close the house quite early in the afternoon, to raise the temperature, syringing the plants at the same time to create a moist, genial atmosphere. After developing for a week or more, the fruits gradually become white, and soon afterwards change to the normal red colour. Discontinue syringing when the red colour is noticeable, for the fruits then are softening, and if wetted, will probably decay. Always endeavour to assist the fruits after they are "set," by giving stimulants to the plants in some form or other. A little guano may be sprinkled upon the surface of the soil and the latter disturbed with a small pointed stick (this allows the guano to enter the soil more easily), or weak liquid manure may be given about twice a week. To insure well-flavoured fruits, more air and a dry atmosphere are essential when the ripening stage approaches, foretold by the change in colour. These various changes in the conditions of the house where Strawberries are grown, must not, of course, be effected suddenly. The air must be gradually increased daily, as the flowers open, until by the time all have expanded, the house is quite cool. The same method should be adopted when the fruits commence to change colour.

Varieties for Outdoor Culture.—Many varieties are in cultivation; some good, others indifferent.

The following are six of the best for a small garden :—

Royal Sovereign : a large, handsome, bright scarlet fruit, of good flavour. The plant bears well and ripens early.

La Grosse Sucrée : this is large, dark red, of fine flavour, good constitution, and early. This variety and Royal Sovereign are the kinds for small growers.

Sir J. Paxton : a very useful variety, large, bright crimson, of rich flavour.

Dr. Hogg : one of the most delicious of all Strawberries; considered by many to be the sweetest in cultivation; large and light red in colour.

Countess : a handsome, conical-shaped, deep crimson fruit, of first-rate flavour, and good constitution.

Waterloo : this is a valuable variety, and is almost the last to ripen. The fruits are large, very dark red in colour (some are almost black, when fully ripe), and of a fine flavour.

Other Good Varieties.—

Latest of All : a very late Strawberry of exquisite flavour.

Aromatic : a fine large fruit with an aromatic flavour. The plant bears abundantly, and is well worth growing.

Bicton Pine is a white-fruited variety of distinct flavour, and bears well.

James Veitch : large, handsome fruit, red, of good flavour.

President : handsome, bright red fruit, well flavoured, good bearer.

Varieties for Pot Culture.—The best for forcing are undoubtedly Royal Sovereign and La Grosse Sucrée. The former is the one for a very early supply. James Veitch and Sir Charles Napier (a pale scarlet fruit of sharp flavour) also force well, and may be tried in addition to the first two named.

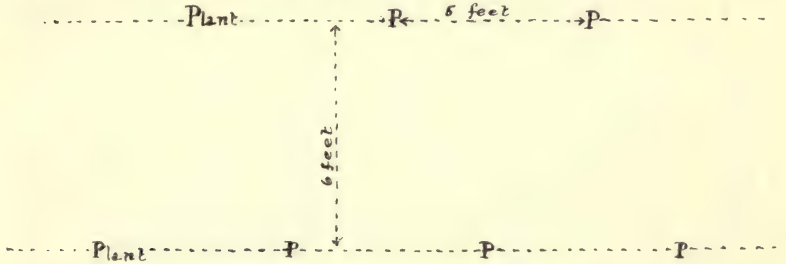
The Gooseberry.—The Gooseberry is one of the most serviceable of our hardy fruits, especially to the amateur, for the bushes occupy little space, and the fruit has the advantage of being ready for use in a green state as well as when ripe.

Soil and Situation.—If very large Gooseberries, regardless of flavour, are desired, a rich, moist soil and partial shade from the sun are necessary.

Unless required for exhibition, however, it is better to obtain medium-sized, well-flavoured fruits; a soil that is drier and not so rich, and a situation exposed to the sun, are then desirable. The bushes themselves will afford sufficient shade to each other. It is more convenient when planting Gooseberry bushes to group them together upon one piece of ground, for when the fruits are ripe blackbirds, &c., are troublesome, making it necessary to cover the bushes with netting. Such protection is obviously more easily given when the bushes are together than when dotted about here and there. The roots are then also in less danger of suffering from the spade or fork, as might easily happen were the ground immediately around them cropped with vegetables. Where, however, land cannot be

devoted solely to a plantation of Gooseberries they may be planted by the side of the garden walk or between Apples and Pears. It should be remembered that their roots are close to the surface of the ground, and if this were dug over with a spade some of the former would be destroyed. Although usually planted upon open ground, Gooseberry bushes may, in order to prolong their season, be trained against a north wall or upon an espalier in a cool position. Unless a few are required very early it is unwise to plant them against a wall facing south. This position is too hot. This refers more especially to the southern part of England. In the northern and midland counties wall protection would be beneficial.

Planting should be performed in the autumn, October and November. Several weeks before planting prepare the ground by digging, and mix with it some manure at the same time. Be sure that the hole to receive the Gooseberry bush is sufficiently large for the roots when spread out, and that it is slightly higher in the centre than at the sides. After the roots have been fully extended and



DISTANCE TO PLANT GOOSEBERRY BUSHES

carefully covered over, make the soil quite firm by treading. Bush plants, in the open, are planted in rows six feet apart, with a distance of about five feet between each plant in the row. The character of each variety should be considered when making a plantation; for instance, early and late sorts must not be placed side by side, nor strong growing varieties close to weak ones. In the former case the work of netting is facilitated (the same nets will do for both if these are kept separate); and in the latter the vigorous bushes do not overcrowd the others, as would occur were both planted indiscriminately.

Propagation.—The Gooseberry is easily increased; the best method being that of taking cuttings, which are formed of a portion of the growth made during the previous summer. They are taken from the bush in the autumn, just as the leaves fall, and are cut to about twelve or fifteen inches in length. Endeavour to select straight, firm, and short-jointed wood. All the buds except those within about five inches of the top of the cutting must be removed. Shoots will eventually develop from these buds to form the primary

branches of the bush. The opposite end of the cutting—*i.e.* where the buds were cut out—is inserted in the ground, five inches or six inches deep. First, take the shoot from the bush, and prepare it afterwards. It is not always possible to obtain the cuttings of one particular length, but whether the latter are rather longer or shorter than the above dimensions does not signify. The object in view is to have a firm shoot—the buds of which have been removed to within about five inches of its apex—sufficiently long to be placed six inches in the soil, and then leave a stem eight inches or ten inches above ground. Thoroughly eradicate the buds from the lower portion of the stem, or growths will eventually push from them and prove annoying. Such growths are known as suckers, and, if allowed to grow, soon crowd into and interfere with the development of the branches proper, besides having an untidy appearance and preventing a free use of the hoe and the application of manure. The more one cuts them back the stronger they reappear. The only way to destroy them is to get down to the buds, whence they originate, and cut them completely out. This, however, cannot be done without injury to the roots; it is therefore wise to make sure that the bud is properly removed in the first place. After having prepared the cuttings plant them out in rows on a shady border. Make the rows twelve inches apart, and let the cuttings be about six inches from each other in the rows. This work should be done as soon as the cuttings are ready—October or early November. The following autumn transplant them into rows eighteen inches apart, with a distance of twelve inches between each. After another year has passed they may be placed in their permanent quarters in the garden.

GOOSEBERRY CUTTING

Forming and Training the Bush.—Suppose that the prepared cutting has passed safely through the winter, and that the buds have pushed into growth. Four or five buds may have been left at the apex of the cutting; it is therefore safe to assume that three of them have commenced to grow. If such be not the case the cutting is not worth keeping. The object of removing the lower buds in preparing the cutting, besides guarding against suckers, was to obtain a clear stem of several inches between the ground and the lowest branches of the bush. Allow the shoots that will develop from three of the buds upon the upper end of the cutting to grow freely throughout the summer, and also laterals that make their appearance. In early winter prune the three principal shoots back to about six inches in length, and cut all the laterals to within half an inch of the base. The following spring two shoots should be allowed to develop from the three primary branches that were shortened in winter. At the close of the second summer there will thus be six branches. Next winter shorten these also to within about ten inches of their bases. In spring encourage two more shoots from each of the six

branches, thus making twelve in all. The Gooseberry bush will then have a good foundation. When afterwards other branches are allowed, if there is room for them, be careful that they do not originate from buds pointing downwards or inwards, or they will defeat the object of the cultivator, which should be to keep the branches thinly disposed so as to admit all sun and air possible.

Summer Treatment.—During the summer months, lateral growths will push from the branches, in addition to the natural fruit spurs that form upon them. The strongest of these should be pinched back to five or six leaves. The object of thus pinching the shoots in summer time is to prevent overcrowding and to encourage the formation of fruit buds at the base of the shoots so pruned. This is better than allowing the latter to go unchecked until the winter, and then to shorten them down. The Gooseberry bears fruit remarkably well upon wood of the previous year's growth, as well as upon spurs that form on the older wood. This fact should not be forgotten, and

GOOSEBERRY SHOOT IN FRUIT (PREVIOUS SUMMER'S WOOD, SHOWING ADVANTAGE OF YOUNG GROWTH)

wherever there is room to introduce a shoot, instead of pinching as above described, allow it to develop, and simply shorten it slightly in winter. The following year it may be expected to bear fruit.

Keep the surface of the ground well hoed throughout the summer months; it will then be kept free from weeds and the soil will not lose so much of its moisture, as if the ground were allowed to become hard. When the fruits are swelling, they are greatly assisted by well watering the ground, and especially so if a covering of manure is first put down.

Winter Treatment.—At the annual early winter pruning the leading branches should be left about eight or nine inches long, until the bush has reached the desired height and size. Then cut them back every year to two buds. When a branch becomes old, and bears little fruit, cut it away, so that a younger one may grow up to take its place; a far better crop of fruit will thus be obtained. In fact the cultivator should endeavour to introduce as much young wood as

possible, never hesitating to remove an old or weakly branch. In the south of England, more branches are usually allowed to form in the centre of the bush than is the case farther north, for if they were kept too thin the fruits would suffer from the effects of the sun, naturally more powerful in the former than in the latter districts.

GOOSEBERRY BUSH, SHOWING FIRST BRANCHES

Cross lines indicate where to cut back to at winter pruning.

Espaliers.— Espalier-trained Gooseberries are excellent, and usually bear well. As is the case with all fruit trees thus trained, they occupy little space, and are therefore useful in small gardens. A trellis-work to train them against can easily be constructed; a few upright wooden or iron posts, placed at intervals in the ground, and wires, twelve inches apart, fixed between them, will suffice. Cordon Gooseberries may either be trained with single, double, or treble stems; each of the latter should be six inches or eight inches apart, so that if the plants have two or three stems, they naturally must be placed wider apart. The management of espalier Gooseberries is simple: allow the leading shoots to grow throughout the summer, and shorten them back slightly every winter, until the top of the trellis is reached. In the month of June, pinch all unduly vigorous side shoots back to six leaves, and in winter shorten them to within about half an inch of the older wood.

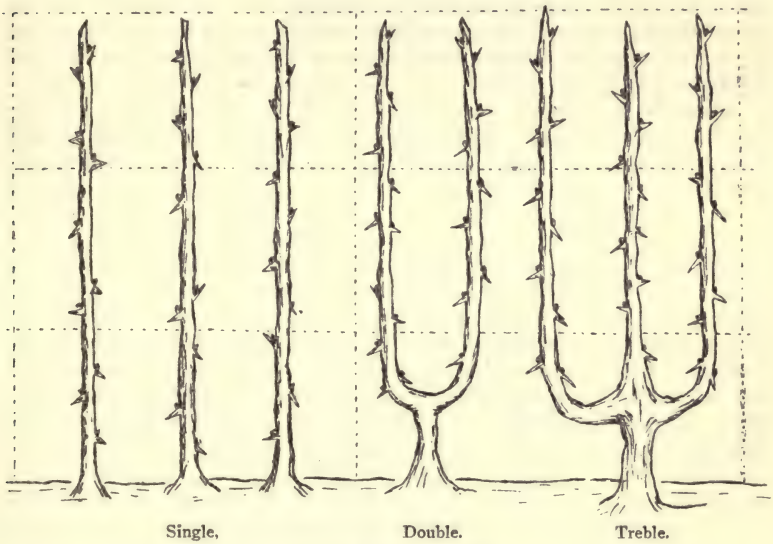
GOOSEBERRY BUSH, SHOWING SIX BRANCHES AT END OF SECOND YEAR'S GROWTH

Fan-trained Gooseberry trees are also used for planting against espaliers. By this method a quantity of young wood may be laid in every year upon which fruit is freely produced. The older shoots must, of course, be cut away to make room for this. In pruning fan-trained trees all that is necessary is to regulate the branches every autumn to several inches apart, retaining the young shoots in prefer-

ence to older ones. In summer endeavour to encourage a shoot from the base of the previous year's wood, so that it may take the place of the latter. Pinch hard back all the other shoots upon the same branch, so that the one at the base may grow freely.

Currants.—There are three kinds of Currants under cultivation for their fruits, viz.: the Black, Red, and White. The Black and the Red both grow wild in this country, and the White is a variety of the Red one.

Red and White Currants.—As in the case of the Gooseberry, Currants may be propagated from seed if there is a special reason for doing so, such as the raising of a new variety, but the most satis-



CORDON GOOSEBERRIES

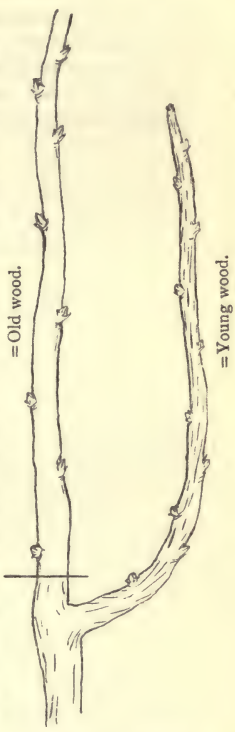
factory, convenient, and generally practised method is by cuttings, which are made in exactly the same way as advised for the Gooseberry. Firm, short-jointed shoots, from twelve to fifteen inches long, are taken off, and all the buds removed, except four or five near to the apex, so that no suckers can appear afterwards. In preparing the shoot cut it straight across, under a joint, for it is only here that roots are formed. If the cut were made, say, midway between the two joints, the end would die back to the first joint above, and probably would not form roots at all. Insert the cuttings on a shady border several inches from each other, in rows twelve inches apart. The principal branches of the Currant bush may be obtained in the same way as described for the Gooseberry, *i.e.* by shortening

each of the primary shoots, so as to obtain two from them, making six in all. Currant bushes are less spreading in growth, consequently there will not be space for so many branches, from six to nine being sufficient. Red and White Currants succeed in any well-tilled land. A deep, loamy soil is the best for them, and a light, gravelly one the worst. Many cultivators plant them against walls to insure a succession. Those trained on walls facing west or south-west provide the first supply, while those on north walls are the latest. As with Gooseberries, it is preferable, if possible, to have all the plants together, either upon a plot of land or in a row by the side of a walk. They should be planted at a distance of from five feet to six feet apart. Plant in the autumn, just before the leaves fall, so that the bushes may become partially established before winter. Do not plant White Currants between Red ones, for the former grow less vigorously than the latter, thus requiring a smaller amount of space for development.

General Treatment.—During summer, to prevent overcrowding, remove altogether those that are weak, and pinch the strongest ones back to six leaves. The cultivator should always bear in mind that to provide the requisite nourishment for the development and ripening of a crop of fruit, a certain quantity of healthy young roots is essential, and the way to encourage their formation is to allow moderately free growth. Always avoid removing a lot of foliage at once. Rather go over the plants daily, and stop a few of the strongest shoots each time, or remove a few of the weak and useless ones. Every winter, until the bush has reached the desired height, the leading shoots must be shortened back to about six inches, more or less, according to whether they are exceptionally vigorous or otherwise. Unless this is done the fruit spurs that eventually form will be very weak. Always cut to a bud pointing outwards, so as to preserve the symmetry of the bush. The side shoots must be cut closely back to within an inch of the old wood. The White Currant does not require to be pruned so hard as the Red, for it is of more slender growth, and less vigorous in every way. During summer spread manure round the bushes, for this keeps the soil cool and moist, and Currants quickly suffer from drought. Do not gather the fruit when wet, especially if intended for preserving. The bushes should be covered with netting when the fruit is ripening, or the birds will prove destructive. Currants are often grown as standards, and are then very useful, especially in small gardens; moreover, they are quite easy to manage. Insert the cuttings as previously advised. In spring only allow the shoot from the top bud to grow, and pinch back the others to one or two leaves as they develop. Do not interfere with the leading shoot until it has reached a height of rather more than three feet from the ground. Fasten it to a stout stake, so that it may be held firmly. In the autumn slightly shorten the shoot, and next spring train four growths from just below the apex, to form the primary branches of the tree. These will thus be three feet above ground. The advantage of standard trees is that other bushes can be

grown underneath them, for there is, of course, plenty of room for the stem of a standard between these.

Black Currants.—The Black Currant delights in a deep moist soil, and prefers a somewhat shaded position. It does not thrive so well on poor, light land, although much may be done to improve this by well mulching and manuring. The Black Currant must have altogether different treatment to that required for the Red and White kinds. In the first place, the lowest buds must not be removed from the cuttings, when these are prepared, for the fruit is borne largely upon wood of the previous season's growth. The object then should be to annually introduce as many young shoots as possible, for these the following year will bear fruit. Suckers produce fruit equally as well as shoots that originate from the branches, and therefore must not be destroyed. At the annual winter pruning remove the old wood to make room for the new, and by thus cutting the older shoots back to a point where a younger one originates the bush is kept full of good bearing wood.



PRUNING BLACK CURRANT. CUT WHERE MARKED

Some of our small birds, bullfinches especially, delight in picking out the buds from Gooseberry and Currant bushes in spring, and if not destroyed or driven away soon inflict serious damage. Caterpillars appear during early summer, and feed upon the leaves. Undoubtedly the most effective plan, although it occupies considerable time, is to pick off the pests by hand. It is an excellent plan to scatter lime amongst the branches of the bushes after rain, so that it adheres closely, and also spread some over the ground. When this is carried out occasionally throughout spring and summer caterpillars are seldom troublesome. Some caterpillars injure the interior of a shoot of a Currant bush, and decay results. If such happens the shoot should be cut off and destroyed. Black-fly also attacks the ends of the young growths; to kill this dip the latter in a strong solution of soft soap and warm water.

Figs.—Amateurs do not pay sufficient attention to this wholesome fruit, for when forced it will give two splendid crops.

Pot Figs.—This is a most interesting way of growing Figs, as they fruit very freely and need little forcing. Propagation is not advisable for amateurs to practise. Those who have no trees or convenience for raising them should purchase from a good source small trees in six-inch or seven-inch pots; they are not costly, and ready for forcing at once. With regard to forcing, so much depends upon when the fruits are required. For May the plants should be started in January

or early in February, and they like a mild temperature. When a little warmth at the roots in the way of bottom heat can be given so much the better, 50 degrees at night and 5 degrees to 10 degrees higher by day being sufficient. This in two months may be increased, the fruits thinned, and feeding commence. All shoots should be stopped at the fourth or fifth leaf from the base, as that is the bearing wood for the next crop. Unless they are stopped the shoots rob the fruits of sustenance, with the result that they turn yellow and drop; this is one of the most important points in Fig culture. After stopping the new wood commences to form embryo fruits in the axils of the leaves, and these begin to swell at the same time as the plants are finishing their first crop. All kinds do not bear two crops, one of the best in this respect being the Brown Turkey, but the earliest variety is the St.

BLACK CURRANT SHOOT

Fruit is on previous season's growth. Current year's wood is dark portion.

John—a white Fig, and the best for pot culture; it rarely casts its fruit. St. John's has a white flesh and green skin, and crops heavily. There are other good kinds, such as Pingo de Niel, a white fruit; Violette Sepor, a reddish fruit of good quality; the White Marseilles; and Osborn's Prolific. Most of these give two crops, but for slow forcing or late use select Negro Largo. Nubian is excellent, but only gives one fine crop and must not be forced hard. For July, August, and later supplies little forcing is needed, if given house-room, as the sun heat with early closing will suffice.

Pot trees when first started need little moisture until in active growth; also only slight damping overhead in dull weather or early in the season. More moisture is required later, and constant feeding is needful when the pots are small. After forcing, they succeed in the open, plunged to prevent dryness at the root, and any repotting should be carried out when the leaf begins to turn colour. As Fig trees

grow very freely it is not well to overpot at any time. As the plants increase in size it may be necessary to rely solely on surface feeding.

The trees are subject to white scale, which should be removed by washing with tepid water and soft soap, scrubbing the old wood with a soft brush. With pot trees fruit may be obtained eight months in the year, and trees not forced hard never fail to crop splendidly. On the other hand, when in active growth, never allow them to become dry at the roots, as then the fruits drop.

Figs Planted Out.—Much the same treatment is necessary for trees planted out in houses. The same varieties are suitable, but none are so reliable as Brown Turkey for general culture. Most of the kinds are inclined to run to wood unless the root-space is confined; indeed, such kinds as the Negro Largo, Nubian, and others fail to fruit at all if given ample root-space or an over rich soil. Of course with trees on walls or trellises a certain amount of young wood must be laid in for leaders or extension, but keep others closely stopped. Only a few leaders are needed, and thus old wood may be removed every winter and new shoots trained in, but give ample space, as crowded trees bear poor fruits.

The temperature given for pot trees will suffice, and avoid at any time a high night temperature; when started in the spring 50 degrees are ample, but a liberal use of sun heat is advantageous.

Soils for both pot and planted-out trees should consist of good loam, to which add a fourth part of old fine mortar rubble or burnt refuse. Wood ashes are especially good, as these and the mortar rubble build up short-jointed fruiting wood. In potting or planting ample drainage and firm potting are essential; indeed, the rammer should be used freely, and give no manure other than as a mulch during the fruiting season. Plunge small trees when fruiting to prevent dryness. After the crop is removed the trees should be freely exposed and syringed in fine weather to keep the foliage clean, and any small spray growth pruned away to admit light to the branches. In taking a second crop thin freely. As the trees bear such heavy crops the early one next season suffers when thinning is forgotten.

Figs for Open Walls.—In many parts of the British Isles plant the Fig under a glass coping or where the wood fails to ripen in cold, exposed positions. On the other hand, in Sussex, the tree does splendidly as a bush near the coast. The Brunswick, a pear-shaped fruit, develops exceptionally well; also other kinds, but this is unusually good. With regard to the position the trees should occupy, choose a west or south wall, and when planting make the soil, or add to it, so that the roots obtain a good percentage of chalk or lime, as this results in a firmer growth; the trees are hardier and more fruitful. March or April is the best time to plant, and the trees may be selected with a single leg or stem, as, unless this is done, sucker growth is troublesome. On the other hand, they may, with advantage, have three leaders. Train these in, and a wall is more quickly filled, as from each of these main shoots others will converge. They should be at a distance of eighteen inches apart; this will allow

for spur-growths from the side shoots, all foreright shoots being rubbed off as they appear—that is, the shoots that push out direct from the point of the main branches. All shoots should come from the sides, and, as far as possible, at about equal distances apart.

There are fewer varieties to choose from for open walls. The Brunswick is one of the best, and Brown Turkey is very fine in a warm soil or upon a south wall. In the north of England and in Scotland Castle Kennedy is a favourite, but it does not bear freely and makes rather gross wood. Brunswick is far more trustworthy and profitable if given room to expand on a warm wall, the old wood cut out, and new growths laid in each year. Another very good open-wall variety is White Marseilles, and, like the Brown Turkey, is excellent when forced—indeed, these two last named and the Brunswick are undoubtedly the most suitable for walls. Even in the south it is necessary at times to protect the trees in winter. Unnail the branches, cut out useless wood in November, tie the branches in bundles, and wrap straw, hay, or, what is better, dry bracken well round the wood, and then encircle with mats. Make the trees firmly secure to the wall after the mat has been placed round the protecting materials. In April remove the covering, and a little later nail the trees in their places, and stop side growths, as advised for forced trees.

Melons.—Many amateurs are afraid to grow the Melon; its culture is regarded as mysterious; but once a few important details are mastered, the work is quite easy. Usually the beginner kills the plant with kindness at the start. Little food is required at first, as a rich root run means gross growth and poor fruits or none at all. Setting is a difficult matter, as the plants run to leaf, the little fruits turn yellow and refuse to swell.

Melons in Houses.—Where Melons are forced for early fruits at least three crops may be taken in the same house by having strong plants ready to put out as fruit is taken from the old ones. Many good growers can take two crops from one set of plants, but great attention is necessary. Beginners could not be expected to do this. If Melon seed is sown in January the fruits should be ripe at the end of May or early in June. Another set of strong plants should be ready, and these will ripen in the middle of August, as from June to August is the most favourable season. Strong plants being put out at that date will finish their fruits in October, but, of course, with frame culture only one crop can be attempted. Sow the seed early in April, plant as soon as four leaves have been made, and grow on, care being taken to ventilate carefully, as with frame culture every bit of warmth from sun heat is beneficial.

Grown thus bottom heat is beneficial, as the plants receive a distinct start early in the year; it is less important later on, but in the autumn it is again useful in finishing up a late crop. A small pit, or a span or lean-to house, is preferable to a larger structure, as atmospheric moisture is better maintained. Excellent crops may be secured in a pit with eight feet to eleven feet run of rafter, or even less, as the

plants may be fruited at three feet from the bed. The best method of culture is unquestionably to run the growth at the start in a single cordon, then stop at, say, two and a half to three feet from the base. The plants will then throw out side or lateral growths, and show both male and female flowers. Both are needed, as, unlike Cucumbers, Melons do not set unless fertilised, and the grower cannot depend on insect agency to perform the work. Pinch out the points of the side shoots when they are from fifteen inches to twenty-one inches in length. By stopping the vigour of the plant is thrown into the fruit. The flowers will now open and require setting, as it is well to secure the first fruits that show; delay means several weeks, as another set must be secured from later growth. In the case of Melons, set the flowers at one time, or within a few days, otherwise the first fruits will monopolise the sap and the later ones refuse to swell. Three or four flowers should at least be set if that number of fruits be required, and that is a fair quantity for plants with limited top growth. The way to set is as follows:—The male flowers are soon distinguished from the female, which have small Melon-like formations at base with the flowers attached, whereas the male is a simple open flower with merely a stalk. The male flower must be taken from the plant with, say, half an inch of the stalk, and gently divested of the corolla or the yellow part quite close to the green portion. The remaining portion will be found covered with pollen, or a fine powder, and this part is gently pressed inside the female flower. It remains there, the latter closes, and in two or three days begins to swell freely. Of course the plants must not be syringed overhead when in flower, and a little more ventilation will be beneficial. From this day feeding may commence, either with liquid manure or with fertilisers. Top dressing with loam to which bone-meal or fertilisers have been added will assist growth. Go over the plants every week, cutting out useless side growths to prevent crowding, and in all cases allow growth to proceed from beyond the fruits. Many crops have been lost by close stopping, practised to prevent growth beyond the fruit, but this interferes with its proper development.

Syringing and watering are important details from the start until flowering time; it is well to syringe early in the day and when closing the house. Damp the house down freely at other times when the weather is bright. Little water is needed at first until the fruits have set, then give more and syringe freely until ripening commences. More air and less moisture will be needful to secure full flavour. In a house a liberal

Temperature must be maintained. At planting, say, in January, 65 degrees at night or 60 degrees in any cold weather will suffice, with a rise of 10 degrees during the day; it is better to promote free growth during daylight than risk over-heating during cold nights. To save hard firing cover the glass with mats or canvas, and stronger growth results. When the fruits have set a few degrees higher temperature will be beneficial, but careful ventilation is more important. On some cold days it will be impossible to ventilate freely, but by

damping down the house and care in firing the temperature can be maintained.

Melons, unless when first planted, need no shade of any kind. Inure them to the full sun as soon as the roots obtain hold of the soil. On the other hand, if there is free exposure, too much fire heat, and insufficient atmospheric moisture, the plants will suffer from insect pests, such as red-spider and black-fly. For the former syringe freely with tepid water, to which add soft soap to make it like milk and a lump of sulphur the size of an egg, and well mix; also cover the plants. Shade the glass for a few days and keep both house and plants moist and the spider will soon disappear, as it cannot exist in a moist house. Black-fly is as troublesome and needs even stronger measures. Dip the affected points of the shoots in tobacco water. Syringe the plants with a weaker solution and fumigate twice a week when the soil is dry, but in the intervals maintain a moister atmosphere, as the pest delights in dry heat. In very bad cases it may be necessary to sponge the leaves, but, if possible, the pest should be destroyed in its early stages.

Another disease, more difficult to eradicate, is canker of the stem, and if not arrested the whole plant sometimes collapses. When first seen put finely-powdered fresh lime over the cankered portion, and always keep the soil dry near the stem when watering. Canker is also caused by allowing a too free growth, severe stopping, too sudden fall of temperature, and excess of moisture. In bad cases a little pest cement may be used, covering the stem with this material round the affected portion.

Soil.—A good stiff loamy soil should be chosen for Melons, and this with a small portion of bone-meal or fine old mortar rubble makes a good compost. Manures are unnecessary; it is wiser to rely on surface foods given when required. The soil also should not be sifted, but left in a rough state, using a little fine material round the roots at planting. Some growers do not make a bed, but place a ridge or heap of soil at the start, say half a bushel to a plant. This is increased by another when the fruits are set, and of a little richer material. Make the soil quite firm, and stake firmly and carefully. Use tepid water for watering and syringing, and put the plants out on the beds at three feet apart in the house. They may be a little nearer if the variety is a compact grower, and four feet may be given if two growths are taken from one plant. To do this stop the plants at from twelve inches to eighteen inches from the soil. The two strong shoots at the upper portion are then trained over the trellis and all those below rubbed out, the main shoots being again stopped at three feet to four feet as advised above for the single shoots. Grown thus plants, soil, and labour are saved at the start, but more attention is needed to secure a full set of fruit. The single growth system at the start is preferable for beginners, and by doing so an earlier set is obtained.

Frame Culture is very similar. The temperatures given above cannot in this method of culture be kept up, but much may be done by careful ventilation, early closing, covering at night, and giving a

THE CARDINAL NECTARINE IN THE OPEN.

thin shade in the day to avoid scorching. Manure will be the heating agency, and place this in sufficient quantity to start the plants freely. If put out in May the plants should bear fruit at the end of August. When planting keep the frame close for a few days, and with frame culture less water is needed, but the soil should be moist all over. A bushel of soil to each plant or light at the start will suffice. Peg the growths down when large enough to the soil, stop at eighteen inches, and train two or three shoots over the surface. Stop these growths when plenty of fruit shows, and then set the fruit as advised, keeping the plants drier and admitting more air. When large enough place the fruits on slates or tiles to keep them from the soil, and useless growths must be removed, as with frame culture ample light is important. Excellent Melons may also be grown in cold frames; but grown thus greater care is needed in watering and ventilating.

Nectarines.—The Nectarine is among the most popular of hardy fruits for its good looks and rich vinous flavour. Moreover, the trees are easily grown, and will succeed on open walls as well as in borders and pots under glass. Nectarines may be grown in either a span-roofed or lean-to structure, which must be light and well ventilated, and supplied with sufficient hot-water piping. The border, which may be either inside or outside the house, should be about two and a half feet deep, and where the subsoil is clayey, cover it with concrete, and have a good fall and a four-inch drain pipe to carry off superfluous water. Several inches of broken bricks should be laid in the bottom of the border, and these must be covered with turf grass side downwards, to prevent the soil from blocking the drainage. Where, however, the subsoil is naturally porous, no concrete will be necessary. Nectarines succeed best in good loamy soil, rather strong than otherwise, with a good quantity of mortar or plaster refuse added. Animal manure should not be used, as it encourages a too strong growth. The firmer the border is made the better. Choose healthy, evenly-balanced trees free from canker, and plant them in November or December. Remove all unripe wood and coarse or damaged roots with a sharp knife, and spread out the rest evenly, covering them with about four inches of soil, making it very firm. Give a gentle watering, and cover the surface lightly with leaf-mould or short manure to keep it moist. Keep the house very cool and airy during winter, and allow the trees to start naturally into growth in spring. When the young shoots are half an inch long commence to disbud, removing all those shoots growing out from the front of the branches, and leaving as many on each side of the previous year's branches as can be laid in without crowding. Should any extra strong shoots start from the centre of the tree, cut them clean away, as if allowed to remain they will rob the rest of the trees of sap. Tie the growths to the trellis, keeping them as straight and even as possible, and freely syringing them every fine afternoon, to keep red spider at bay. Admit plenty of air, keep the border moist, and when the foliage commences to change colour in autumn keep the ventilators open continually. When the wood is ripe prune the trees, cutting the shoots back into the firm wood, and

training them carefully to the trellis, finally washing the woodwork and glass with warm soapy water, the walls with lime-wash, and picking the border over with a fork. Early in the following February close the house, well water the border, and syringe the trees with tepid water morning and afternoon in fine weather. Admit air liberally but cautiously, and when the trees are in bloom maintain a temperature of 50 degrees with a rise of 10 or 15 degrees from sun heat, together with a rather dry atmosphere, and give the trellis a sharp rap at midday to disperse the pollen, and assist in setting the fruits. Syringing must be discontinued while the trees are in flower, but again resorted to directly the fruit is set. The border and pathways of the house must also be sprinkled several times daily. Disbud piecemeal, commencing at the top of the tree and removing a few shoots daily. A shoot should be left at the base of each fruit-bearing lateral, and one at the extremity, all the intermediate shoots being removed. If the fruits set thickly, a few of them must be removed at a time, and the rest left about six inches apart. Keep the border moist, admit air freely in fine weather, and if green-fly or thrip makes its appearance, fumigate the house mildly several times with tobacco paper. As soon as the fruit is stoned, the final thinning must be made, leaving them nine inches or ten inches apart. Close the house early on sunny afternoons, to shut in all the sun heat possible, and induce the fruit to swell. Water trees carrying heavy crops with weak liquid manure, or sprinkle a little native guano on the surface, and water it in. When the fruit commences to colour cease syringing, and mulch the border with short manure or dry bracken to prevent rapid evaporation. A somewhat dry atmosphere and a liberal supply of air night and day are necessary for the production of large, richly-flavoured fruit. After the fruit is gathered, all shoots which have borne fruit must be cut out, in order to admit all the light and air possible to the current year's wood. Very little pruning will then be necessary in winter. From this time until the leaves fall off, plenty of water at the roots, a continual supply of fresh air, and frequent copious syringings of the foliage will be the chief requirements.

Nuts.—The amateur gardener in the country could often grow Nuts in the garden or orchard and enjoy a profitable pastime, but careful attention must be given to the trees in the early stages of growth. Nuts, like other fruit trees, succeed well in good soil. In Kent the Cob and Filbert trees are first favourites, and excellent prices are obtained for the Kent Cobs; indeed the Kentish trees, owing to the attention received, frequently bear when others fail. The beginner may grow quite as good Nuts as dwellers in Kent, and at no great cost. It is useless to plant hedges and allow them to grow in their own way. The pruned trees are not so pleasing in appearance in winter as a pyramid bush Apple or Pear tree, but they are quite as profitable. Once the trees have assumed their correct shape they do not give much trouble.

The trees are raised mostly from layers, and this is the best system to obtain a true stock, as though at times seedlings come true they are

not trustworthy. In the Kent Nut-fields the trees do not always occupy the whole space; the trees or bushes are trained low, and there are rows of standard Plums or Apples at distances of thirty feet to forty feet apart, and these trees, in addition to being valuable for their crop, act as a protection to the Nuts when in flower in spring. No one who can grow good Plums or stone fruits need hesitate about planting Nuts, and though they like a deep and well-drained soil, in some parts of Kent there are excellent trees on banks in rough, poor soil, which, however, in many cases, is top-dressed with quick acting fertilisers. Excellent crops are produced.

The beginner should purchase stock from a good source, and select the best kinds. As these trees begin to grow early in the season autumn planting is advised. When planting leave the trees ten feet apart. Fifteen feet is sometimes allowed, and then there is none too much room; but almost everything depends upon the soil and variety. Some kinds require greater space, and when twenty feet is given between the rows dwarf bush fruits may be planted. The smaller space is preferable between the trees in the row, and give, say, thirty-one feet to forty feet clear space for standard fruit trees. On the other hand, when fifteen feet is allowed, and bush Currants, Gooseberries, or even rows of Strawberries are grown between the trees, when the Nut bushes need more space it is an easy matter to destroy the bush fruits. It may appear strange to the beginner to be told that trained and regularly formed Nut trees are far more profitable than the rougher type seen so frequently in gardens. Those who intend to make Nuts profitable would do well to study the two systems. Trees in a garden are often merely a thicket or hedge of growth and a few Nuts appear at times. Then there is a fair crop on that portion of the trees exposed to the light. The Nut, on the other hand, is not at all fastidious as to soils, and rarely fails when hard pruned year after year, so that the restricted branches are like an old Apple tree cut hard back yearly and only spur-growth allowed to develop.

The trees are in many cases kept quite open in the centre, or what may be called cup-shaped. Some, however, are more spreading and resemble saucers or shallow bowls. When the form of the trees has been decided upon cut away strong side shoots at pruning time, but leave the small twiggy wood, as this produces the fruit and catkin, to assist in setting a crop. Cut back also the main or leading shoots when no extension of the trees is necessary, and these will then form spurs or buds for next season's supply.

The Cosford bears catkins abundantly, and on this account alone is valuable to plant among other varieties. It is also a first-rate variety with a roundish nut, thin shell, and very sweet flavour. This will come quite true from seed, which makes it a valuable garden variety. No matter what variety is grown, sucker growth should not be allowed, and if the trees are a fair size when obtained they will have a clear stem of at least one foot to two feet from the soil. The aim of the cultivator should be to keep the trees open. Secure six to eight or

more leaders, and then prune close in every season, allowing the main shoot to extend as far as desired.

In a few words, the main or strong lateral growths are cut close, the short, small spray wood is left, and no suckers are allowed from the stems or from the soil. Many years must elapse before large trees can be formed, but once formed they remain fruitful for a lifetime, and, given food in the way of surface dressing in the winter months, they are most profitable. Night soil, mixed with long litter that has been in heaps for some months, may be made good use of for old Nut trees. Young trees that produce gross wood should not be fed.

Varieties.—The following are a few of the leading kinds. One of the best is the Cosford, which has been already described. The Kentish Cob is one of the most prolific, a good market variety and free, and the newer Webb's Prize Crop promises well. This is an improved Kent variety, and a larger cob than the older one. In the Filbert none can beat the true Kent variety for flavour, but this should be planted where a little protection can be afforded. It is not so prolific as the old Red Filbert, which has a red skin and is very free. The Filbert Prolific is distinct, produces fine clusters, having a cut or frizzled husk, and is much liked in its green state before being kept.

The Raspberry.—The Raspberry grows wild in moist and shady places in many parts of England. Its home life reveals its requirements as to soil and situation. It succeeds best in a deep and moist soil. In poor shallow soil its surface roots suffer from insufficient moisture and nourishment. If the ground upon which it is intended to cultivate Raspberries is light and rather poor, improve it by digging in decayed leaves, or other refuse from the vegetable garden, and also manure if available. A good mulch early in spring for a short distance around the canes is of great benefit. The numerous fibrous surface roots are kept cool and protected from the drying effects of the hot sun, while they are benefited by the mulch.

Planting.—The best time for this is when the leaves are falling in autumn, viz., in the month of October. Raspberries are usually trained to horizontal wires fixed between upright poles. These espaliers (for such are formed by the poles and wires) should be five feet apart, and each plant about two feet from its neighbour. If autumn planting is impossible postpone the work until the month of March. This is preferable to planting in midwinter, when the soil is cold and wet, although such good progress cannot be expected from spring-planted canes as from those put in during October. The latter have an opportunity of becoming established before winter, and are then ready to start well in spring. Raspberry canes may also be trained to single stakes, placed in rows five feet apart, with a distance of three feet between each stake in the row.

The shoots, or "canes" as they are generally called, of the Raspberry are produced every year either from a perennial (*i.e.* living for several years) root-stock, or from the roots. In the latter case they are termed suckers. It is not advisable to keep the root-stocks of

Raspberries more than six or eight years; but replant with younger canes, as from these finer fruit is obtained in greater abundance. The canes that develop one season produce fruit the next; thus while the canes of the past year are bearing fruits, others are developing to provide the following summer's crop. It will thus be apparent that the cultivator should endeavour to produce as many firm healthy canes every year as can be comfortably found room for. When the fruit is gathered the canes upon which it was borne should be removed, for they are of no further value. Cut them off at their base and draw them downwards to avoid injuring the remaining ones. If the Rasp-

RASPBERRY. ONE-YEAR-OLD CANE IN FRUIT: CUT OUT AFTER GATHERING THE FRUIT

CURRENT SEASON'S GROWTH FOR FRUITING NEXT YEAR

berries are grown against stakes not more than six or eight new canes must be allowed to remain annually. When trained against horizontal wires leave a space of several inches between each cane. Those shoots not required for fruiting the following year should be removed early in the season, soon after they make their appearance. The whole vigour of the plant may then be concentrated in developing only the necessary growths.

Summer Treatment.—This consists in destroying weeds by means of hoeing the ground, covering the surface of the latter with manure, and allowing no more than the necessary number of canes to remain. When the fruits are swelling, if the weather is at all dry, a

good watering will prove helpful. As above mentioned, after the fruits are gathered, cut away the old canes so that the younger wood may not be interfered with. In the autumn shorten back the strongest canes of those that are to bear next year's crop of fruit to about five feet, less vigorous ones to, say, four feet, and the remainder to about three feet. Such a method prevents overcrowding.

Propagation.—The most convenient method of increasing the Raspberry is by means of suckers, which, as already mentioned, are produced from the roots. The strongest of these should be carefully detached, and planted in good soil in the autumn, and eventually trained either to stakes or wires. When planting cut down the shoot to within ten or twelve inches of the soil. This will bring about the production of stronger canes the following year than would be the case if the primary shoot were left unpruned. Offsets from the root-stock may also be used for propagating These must be carefully removed from the established plants so as to disturb them as little as possible. Root suckers are often produced at some distance away from the parent plant, and so can be detached without fear of injuring the latter.

Autumn-Fruiting Raspberries.—Raspberry bushes may also be had in fruit in the autumn. The plants, however, require different treatment to the summer-fruiting kinds. The fruit is borne upon the current year's growth and not upon canes made during the previous year. The proper way is to cut down the canes in the month of February to within a few inches of the ground, and shoots will then push from them vigorously. These must have a liberal amount of sun and air so as to become well developed before the end of summer. The canes should therefore not be quite so close together as the summer-fruiting ones. Water liberally if the weather is dry, and also give manure water to assist fruit development. The following varieties are suitable for autumn fruiting:—Belle de Fontenay, large, red; Noire d'Antomne, large, very dark; October Red, bright red; October Yellow, medium sized, yellow.

Summer-Fruiting Raspberries.—Superlative, large, red, producing heavy crops of fruit; Hornet, a fine large red variety; Baumforth's Seedling, an excellent variety, red.

FRUIT TREES AS GARDEN ORNAMENTS

The best use of many fruit-bearing trees is not restricted to the kitchen garden only, for many of them are beautiful things in the most dressed ground. Few small trees are more graceful in growth than the old English Quince that bears the smooth roundish fruits. It is not only a pleasant object in leaf and flower in early summer and in autumn glory of golden fruit, but even when bare of leaves in winter, a fully matured tree is strikingly beautiful; and in boggy ground, where no other fruit

tree would thrive, it is just at its happiest, and is most fruitful. Then many Apples are extremely ornamental; and there is a whole range of Crabs—Siberian, Chinese, John Downie, Dartmouth, and other home-raised hybrids—that are delightful things both in flower and fruit. *Pyrus Malus*, vieing in beauty of bloom with its near relatives the Japanese Quinces, quite outdoes them in glory and bounty of fruit, so brilliant in the autumn garden.

There are no better garden ornaments for foliage than Figs and Vines, and though the needful pruning of a Vine for fruit takes off somewhat from its pictorial value, which depends in some measure on the wide-flung luscious summer growth and groping tendril, yet in any shape the Grape Vine is a thing of beauty. Some of its garden kinds also show how, in distinct departures in colour and shape of leaf, it is always beautiful, for the parsley-leaved Vine, with its dainty and deeply-cut foliage, is a suitable accompaniment to the most refined architecture; while the red purple leaf of the Claret Vine and its close clusters of blue fruit are richly ornamental in autumn.

A Medlar tree, with its large white bloom, and handsome leaves, is desirable, and several of the Services are ornamental small trees.

Every one knows the lovely pink bloom of the Almond in April; but few may have tried something that is not an experiment but a certainty, viz., the successful culture of the hardier Peaches, near relatives to the Almond, as standards in the south of England. A Peach of American origin, the Early Alexander, bears full or fair crops every year. The only danger is from leaf blisters from sudden cold in May; but if its place is sheltered, or if it can be afforded the protection of a net, it will suffer but little, and perfectly ripened Peaches, red all round, may be had at the end of July.

The beauty of Cherry blossom is so well known that it needs no extolling; and any great and high wall looks the better at all seasons for a well-trained-on Pear.

A free planting of the cut-leaved Bramble is pleasant to see on the outskirts of the garden, and is beautiful in leaf, in flower, and in fruit.

A SMALL ORCHARD

The usefulness of a small orchard when judiciously planted and well managed can scarcely be over-estimated, and every country house should possess one. To those who have

families a small orchard is indeed a boon, and if planted with early, mid-season, and late varieties of Apples and Pears, the happy owner is enabled to supply his children with delicious apple puddings and pies for eight months in the year. Moreover, in plentiful seasons, there are always more Apples, Pears, and Plums than can be used at home, and these, if carefully picked and packed, can be profitably disposed of at the nearest town. Then a small orchard can be tilled with the spade at small cost, and vegetables and choice small fruits, such as Strawberries, Gooseberries, and Black Currants, may be grown between the rows of fruit trees for several years, and thus the usefulness of the orchard is increased. In small gardens, even, space can generally be found for a small orchard, whereas a large one is quite out of the question. Of course, its utility will largely depend upon the varieties of fruits grown in it, and the kind of stocks they are worked on. Apple trees should be in bush form and be grafted on the Paradise stock, and Pears on the Quince, as then they commence bearing fruit the first year after planting, which is a great advantage. When Apples are grafted on the Crab many years often elapse before they commence to fruit. It is also necessary, in order to realise the full usefulness of a small orchard, that only a small number of early Apples be planted, as these will not keep long. A fair number of mid-season sorts may be allowed, but at least one-half the number of Apple trees should consist of late keeping sorts, as they are the most useful in every way. Of Pears a fair number of trees of Swan's Egg, Louise Bonne of Jersey, and Doyenne du Comice may be planted; but stewing Pears are the most useful, and they will keep until May. Few fruit preparations are more delicious than a dish of Catillac, Vicar of Winkfield, or Suffolk Orange, and children enjoy the wholesome meal. The best way to stew them is to peel and put them into an earthen jar in a syrup, seal the jar, and place them in a steady oven until soft and brown.

As already stated, small fruits and small vegetables may be grown between the fruit trees for several years, and what is more useful in the household than Strawberries, Gooseberries, and Currants, or a good supply of wholesome vegetables. The best trees to plant round an orchard for shelter are Damsons, Bullaces, and Nuts. Plant a Filbert or Cobnut between every Damson and Bullace, and in two years there will be a perfect hedge. Bullaces and Damsons being very hardy invariably bear good crops of fruit, and they make delicious puddings and pies; and Wine Nuts are quite as useful too.

FRUIT TREE CULTURE IN POTS

General.—It cannot be said that fruit tree culture in pots is a new system by any means, nevertheless it has not become general. It has oftentimes been demonstrated in a most practical manner by the Messrs. Rivers & Son, and may at any time be seen in full operation at their nurseries. Other trade growers have also taken up this mode of culture, so that now plenty of pot-grown trees may be had. Continental growers also adopt this system, and that with equally marked success. Possibly this departure from the usual methods was not so well understood a few years back as it is at the present time; hence failures were more common no doubt. Failures will occur if ordinary precautions be not taken; thus, for instance, it is unreasonable to suppose that trees in pots can be successfully grown under the shade of other trees, *i.e.* trained ones, or in houses that are not supplied with a reasonable amount of ventilation. The system is applicable either for forcing or for cultivation in absolutely cold houses. The idea has existed that the trees in pots are not long lived; this is quite a mistake, and in proof of which one has but to inspect the large specimens at Sawbridgeworth, some of which are a quarter of a century or more in point of age. Canker, which in some instances is so destructive, does not disturb pot trees. As regards insect pests, the balance again is in favour of this system. Where early forcing is practised, it is possible to take two crops at least from the same houses, with, in some cases, a partial crop of something else in addition. Thus, after early forced Peaches and Nectarines, Melons can follow, and pot Figs after the Melons. After pot Cherries Plums and other fruits not forced make a succession, these being cleared off in time to house Chrysanthemums. These are only a few instances; other crops will suggest themselves, such, for instance, as pot Strawberries upon shelves.

Houses.—The best plan of house for pot fruits is the span roof beyond any doubt, abundant means of ventilation being provided. Houses of elaborate or expensive construction are totally unnecessary, in fact, they are a waste of money. The heating should be sufficiently provided for where forcing is carried out, so that no undue degree of heat has to be maintained in the pipes. Rather than have houses of large dimensions, give preference to those of moderate size. All the light possible should be secured by using large panes of glass—say, twenty inches by fifteen inches, which is an

easily procured stock size. No staging whatever is required beyond shelves for such as Strawberries in pots. For the floor either gravel or coal ashes form a good bottom, one object being to exclude worms.

The Trees.—Autumn is the best season of the year for making a start, by forming, or adding to, a collection of pot trees. The best trees to choose are those of two, three, or four years' growth; these should have been grown one year at least in pots, such being more amenable to treatment the following season. Peaches and Nectarines are much better if cultivated in pots from the bud stage onwards than when allowed to make one season's growth, and that often a too luxuriant one, in the open quarters of nursery grounds. All pot trees should be bristling with flower buds when purchased in the autumn season of the year, if they are not so the management is at fault rather than any peculiarity of the trees themselves. As a rule the pots of newly-purchased trees should not exceed ten inches in diameter, unless trees of extra size are desired.

Potting.—The question is often asked—Is it necessary or expedient to pot the trees annually? The answer is Yes, by all means do it in every instance. It is a popular delusion, as well as a decided source of failure, to omit this work every autumn. The annual repotting is productive of fine fibrous roots which are the essence of fertility. If not so treated the soil before the second year has expired will become utterly exhausted, whilst the requirements in the way of watering are increased. It must not be inferred from this that larger pots are recommended every autumn. A larger size of pot once in three years is ample, as a rule, for the trees. On no account should the trees be put into larger pots without first having reduced the balls, in a more moderate degree, however, than when similar sizes of pots are again to be used. In the latter instances a sufficient reduction must be made to insure a good amount of fresh soil—such, for instance, as will allow of the fingers being passed freely around and between the balls and the pots. Firm potting is absolutely essential both in order to prevent the water percolating through the new soil rather than the old balls, and in order to foster fibrous root action. In order to do this work well pot rammers must be used. In reducing the balls take away the lower portion as well as the upper, and in repotting allow sufficient room for watering and top-dressing. The best tool with which to reduce the balls is a small claw-like instrument about the length of a wall hammer. This is easily made. If any roots show signs of over-luxuriance, it is advisable to cut them off clean with a knife rather than break them

away. Should there be the slightest tendency towards being dry at the roots the ball should be well soaked in a tub of water. After potting, those trees that are intended for forcing can either be stood again in an open, sunny position if the weather be fine, or taken under glass if there be room to spare. It is certainly advisable to place the earliest forced trees under glass early in October, or, at any rate, before any heavy rainfall takes place. When taken under glass they may be stood almost pot to pot. One thorough soaking of water after potting will last for a long time, but syringing is recommended once or twice a day when it is sunny and warm weather. It is better to get the potting under hand before all the leaves have fallen. Guard as much as possible at all times against worms getting into the pots. For the potting the best loam obtainable should be used; that having a tendency to be calcareous is the most suitable. A tough fibrous loam that will not become close and adhesive should have the preference. In addition some lime rubble, such as that from old buildings, should be added in the proportion of about one barrowful to a cartload of loam and twice that amount of manure, such, for instance, as that taken from an old Melon bed; the manure from the stable direct will also answer after repeated turnings. It is hardly desirable to use any artificial manure at this juncture; if any be used let it be bone-meal, which will supply all that is needed until stoning takes place.

Pruning, &c.—A slight amount of pruning may be done at the time of potting, but it should only be superfluous lateral growth. A better time on the whole is at the starting period, but even then it is not advisable to prune as in the case of trained trees. It is a safer plan to prune after the fruit is set and when one can see what the crop is likely to be, say when the fruits are about the size of nuts. No disbudding whatever is advised for pot trees, the spring pruning at various periods during growth supplying all that is needful. Pinching the leading shoots where such are seen to monopolise too much sap is quite necessary, and this may have to be done repeatedly. Only sufficient wood need be retained to provide for the following season; to grow superfluous shoots and then have to cut them away is misdirected energy. Thinning of the fruits follows as in the case of trained trees, for young, newly purchased trees in the pots named ought not to carry more than eight to ten fruits, or a dozen if the trees be extra strong. When the fruit is swelling freely liquid manure, made from stable manure with a small amount of soot, forms a good stimulant alternately with a small pinch of an artificial

manure in which there is a good percentage of phosphates, to aid in the proper development of the stone. Top dressing or mulching with decomposed manure and loam is a great aid when the fruit is growing freely. Temperatures are the same as in the case of trained trees, so also the treatment for insect pests, bearing in mind that a thorough fumigation at the time of starting is most valuable. When the trees are hardened off after fruiting they should be plunged to the rims in an open position until the time of potting comes round again, and not overcrowded.

Varieties recommended for pot culture (the best six of each) :—*Peaches*—Alexander and Hale's Early for early forcing (both are rather given to drop their buds), Early Grosse Mignonne, Dr. Hogg, Sea Eagle, and the Nectarine Peach. *Nectarines*—Cardinal, Early Rivers, Lord Napier, Pine Apple, Victoria, and Albert Victor. *Plums*—Early Prolific, Jefferson, Early Transparent, Golden Transparent, Coe's Golden Drop, and Reine Claude de Bavay. *Cherries*—Bigarreau de Schreken, Early Rivers, Frogmore Early Bigarreau, Governor Wood, and Belle d'Orleans (include a May Duke for pollen purposes). *Pears*—Fondante d'Autômne, Conference, Doyenné du Comice, Pitmaston Duchess, Marie Louise, and Durondeau. *Apples*—Ribston Pippin, Cox's Orange Pippin, Washington, King of Tompkin's County, Mabbot's Pearmain, and Allington Pippin.

The Logan Berry.—Much has been written about this new fruit, but as we have had no actual experience of it we allow Mr. Wythes to record his observations, which he has done in the *Garden*, as follows :—

"The Logan Berry is important from a commercial point of view, as it is doubtless one of the most useful fruits we have for preserves and compotes, and, in addition, is remarkably prolific. During the past two or three seasons in the northern part of the country (Alnwick Castle) this fruit has been a great success. It is planted at the foot of a warm wall, and the new growths yearly measure from ten feet to fifteen feet. These bear very heavy crops the following season, and the plants produce an abundance of new wood ; indeed, so much so that thinning is necessary. The fruits are produced in clusters, and closely resemble a large Raspberry as regards size, but are firmer, and the colour of a Blackberry. Doubtless the Logan Berry is the result of a cross between the Blackberry and the Raspberry, and the growths more resemble the last named. The fruits when ripe are firmer than those of a Blackberry, and have a more acid flavour. The latter point is a great gain, as it is so much better for preserves. I am not at all sure that every one would call it a good dessert fruit owing to its brisk flavour. For my own part I think ripe fruits are delicious,

KENTISH PIE OR RED CHERRY.

and their distinct character and flavour will make them much liked. It is an American introduction, and was named the Logan after the raiser, Judge Logan, but I am not sure if the plants will all come true from seed. One of our best fruit growers says they are not reliable; if so, this is unfortunate, as a great number of seedlings have been raised, and I fear will cause disappointment, as the original berry is remarkably free, prolific, large, and dark coloured. Of course there is no question whatever but that the plants propagated from the original stock will be good, but this is a slower process, and not always carried out. The plants I have referred to were doubtless true, as we could not have hoped for better fruit, and the demand increases as their value becomes known. The culture of the Logan is quite simple. In the south (Brentford) we have reversed matters and planted on north and east aspects, as our soil is shallow and dries quickly. I thought a cooler site would be advantageous, but there is no need whatever to grow the plants against walls, as they are as good in the open, but need room if the growths attain the size I have named. Doubtless too much training or cutting in is not advisable, and the most simple methods of culture will give a better return. If grown as a bush, a strong stake at the start would suffice, but as the plant rambles the fruits through resting upon the soil become spoilt. My reason for advising wall culture is that the growths grown thus give so little trouble, and one can often cover a bare place that is not utilised for choice fruits. Grown like the Raspberry, the plants are a great success, and as they give fruit for a long time it is an advantage to have them in diverse positions to get late and early supplies.

USEFUL HINTS

Bulbs after Flowering.—Bulbs that have been forced or grown in water, both of which methods of treatment are somewhat against their nature, cannot be depended upon to flower again the following year. If it is thought worth while to keep them at all, they will have to be nursed into well-being by being planted in a warm aspect in well-drained soil, and left for a year to recover, after which they may be used again, though they may not be so good as properly-grown Dutch Bulbs, which are now so cheap that it is hardly worth while to practise the nursing plan.

Care of Old Trees.—Almost every garden contains one or more veterans which are for some reason precious to their owners. The two immediate causes of premature decay are starvation at the root and injury by storms and disease. Such trees as the Beech and the Horse Chestnut, that root close to the surface of the soil—quite differently to the Oak—may often be invigorated by covering the ground with a few inches of good soil or short manure. Artificial watering during long drought, provided that it is thoroughly done, is another great help. Trees with large crowns of branches are frequently seen thinly furnished with foliage, and altogether sickly in aspect, owing to unhealthy or insufficient roots. The balance between top and bottom has been destroyed. To restore it in some measure, the top growth may be reduced by pruning and shortening branches here and there, wherever it can be done without spoiling the appearance of the tree. This demands careful judgment, but some old trees in a sickly state can certainly be rejuvenated in this way. It is of no value in the case of trees with decayed trunks, nor with those, like our Common Oak, which will not break from old wood. But Elms, Robinias, and Red Oaks are amongst those that respond to this treatment. Old trees with insecure branches can often be preserved from mutilation by storms if the main branches are fastened together or on the trunk. The common practice of putting an iron collar round the branch should be abandoned. The iron prevents the natural expansion of the branch, and ultimately chokes it. A better way is to use a strong iron rod with a plate at the end, and instead of supporting the branch by encircling it, a hole is bored right through the centre of it, through which the rod is pushed from the outer side. In this way the weight is borne by the iron plate, which should, by removing sufficient bark, be allowed to fit close in to the wood. New bark will gradually close over and hide the plate, and instead of an ugly iron collar cutting into the wood, the only evidence of artificial help is in the rod coming from the inner side of the branch. It is important that branches or snags that have to be removed should always be sawn off quite close to the trunk or larger branch from which they spring. When a stump even no more than a few inches is left, the new bark and wood are unable to close over it, and the wood ultimately decays and acts as a conduit for moisture and fungoid diseases. A coating of liquid tar over the wound, renewed once or twice until the new bark has closed over, is a perfect protection against these evils. Trees decayed in the centre, with only an outer layer of healthy wood, are, of course, doomed; but by filling up the holes in the early stages of decay, and thus keeping out moisture, their term of life can often be lengthened by many years. Holes made by woodpeckers can sometimes be plugged up with a piece of oak. This, if left on a level with the bark, will often enable the latter to close over the hole. Large holes may be filled with cement, or even built up with bricks, the surface being made water-tight and tarred over.

Cleansing Plants.—Whilst every one recognises that as soon as plants of any description become infested with insects they must be made clean, it is not so generally understood that cleanliness is indispensable to the health and growth of all plants even when no insects are present. The larger the leafage, especially of plants grown under glass, the greater their breathing area, and as leaves are like lungs, constantly giving off gases and absorbing others, it is of the first importance to keep them clean. Outdoors, rains or heavy syringings will generally do that. Indoors, because the culture is somewhat artificial, there is greater need for cleanliness. Leaves should therefore be often sponged or syringed to free them from dust and soot or other dirt. This is specially necessary with thick leathery leaves.

Coops for Winter Protection.—Mr. G. F. Wilson, of Weybridge, has a most useful coop for protecting winter flowers, especially the Christmas Rose. He writes that he has at Wisley a place which suits both the winter and Lent Hellebores:—"Ours are planted in a bank at the side of a ditch facing north, shaded by a high hedge at the south side of the ditch. The soil is light loam, and in ordinary years rather moist. Some good authorities advocate planting in the full sun. Our experiments have gone the other way. Perhaps it is a question of stiffness of soil. As the flowers when out have often hard frosts and heavy rain to contend with, glazed lights are frequently recommended to protect them. My object in this note is to recommend coops, as being much lighter and as covering larger plants. We began by using common wicker hen-coops covered with green scrim, but after a time the wood got out of shape and decayed, so iron wire was substituted for the skeleton. If these coops are put by in the summer, if not in use, in a dry place, they will last for many years. After the Hellebores they are useful for *Anemone fulgens*."

Covering for Close North Paling.—Many beginners regard the north aspect as unsuitable for plants in general, but it is as easy to plant a paling with a north exposure, and to make it beautiful with a flowering covering, as one with any other position; indeed some plants, by no means the hardiest, such as Escallonia and Ceanothus, will often on a north wall or fence escape that vernal danger of sun on frosty stems or foliage that so often kills these plants, or at any rate cuts them to the ground in any sunny aspect other than westerly. Any of the Ayrshire Roses would do well, and the common pink China, also the beautiful and long blooming hybrids of China and such fine rambling things as Penzance Briars, Mme. Alfred Carrieré, and Reine Olga de Wurtemburg, the grandest of roses for winter foliage. Wistaria would also do, and the Clematis species, such as *montana*, *Flammula*, *graveolens*, and *paniculata*. *Jasminum nudiflorum* is naturally at home in such a place. The Guelder Rose, trained as a wall or fence covering, is admirable; and another handsome shrub that is excellent for the same use is *Spiræa lindleyana*, all the prettier if *Clematis Flammula* runs into it. The Roses named are—all but the China and hybrids—strong and even rampant growers. Reine Olga will throw out shoots 15 feet long in the year, therefore these should be planted a good distance apart. When the fence is not high, say about 5 feet, the Roses must be trained down and are all the better for it.

Destroying Wasps' Nests.—The simplest and most certain material with which to destroy wasps' nests is cyanide of potassium. A very small quantity of this may be dropped a little way in the hole of the nest, the entrance being at once closed with a piece of turf. Cartridges of gun cotton, dynamite, or other similar explosive, with lighted fuse attached, then placed in the hole, will generally blow the nests to atoms. One may use with almost equal effect ordinary squibs of gunpowder, brimstone, or saltpetre, as the smoke being enclosed the wasps are quickly destroyed. These measures should be taken at night when the wasps are in the nest. Rag soaked in tar and put on the end of the stick which must be lighted, thrust into the hole, and a thick piece of turf to stop the entrance, will kill the marauders.

Flowering Trees and Shrubs for Windy Places.—Only vigorous trees and shrubs should be planted in very windy places. Where Rhododendrons and Azaleas succeed they may be planted freely for their spring beauty, and, in the case of the former shrub, evergreen foliage too. Barberries may be tried, and they bear beautiful flowers in spring and summer, followed by showy fruit in autumn. The purple-leaved Barberry (*B. vulgaris purpurea*) is an effective, dark-leaved shrub, and will flourish in quite barren ground. The Phillyreas form a small group of compact, evergreen shrubs, and, with the exception of *P. decora*, also known as *P. vilmoriniana*, all have graceful deep green leaves, and are quite hardy. The Spanish Broom (*Spartium junceum*) is another good shrub for the purpose. One may also choose from the Thorn, Laburnum, stronger growing forms of Deutzia, Bush Honeysuckles (Weigela), Snowdrop Tree (Halesia), Lilacs, Flowering Currants (Ribes).

Garden Plants that will bear Flooding.—Many of my readers are placed by riversides, and some part of the garden is flooded occasionally in winter. A correspondent in the *Garden*, "A. B.," in response to a question about the plants likely to succeed under such conditions, gave a list from his experience that will succeed:—"Several forms of Lychnis, Spiræa, Myosotis (Forget-me-not) in various perennial forms; Lupinus, Leucojum (Snowflakes), Flag or German Iris, Trollius (Globe-flowers), Caltha (Marsh Marigolds), in variety; *Chrysanthemum latifolium* and *C. maximum*, with their hybrids; Bunch Primroses, Polyanthus, *Primula japonica* (plant this on the water edge of the river), Daffodils, Snowdrops, Fritillaria, double form of Meadow Saxifrage, *Anemone japonica*, Hemerocallis (Day Lilies), these will revel in a damp root-run; Aconitum, Pæony, Helianthus (Perennial Sunflower), Delphiniums (to see these at their best add peat to the soil), Starworts, Phlox (must have very rich soil), Doronicums, Campanulas (to get best effect add peat and leaf-mould), Oriental Poppies, *Achillea Ptarmica*, the Pearl,

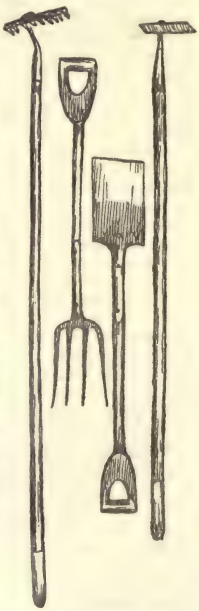
Linosyris vulgaris (Goldilocks), Columbine, Rudbeckia, *Erigeron speciosus*, *Eryngium alpinum*, Galega (Goat's Rue), Geranium (Cranes-bill), *Tradescantia virginica*, Polemonium, Geums, Ribbon Grass, *Adonis vernalis*. Hollyhocks, Cannas, Dahlias, Begonias, and Gladioli can be lifted and stored for the winter. May-flowering Tulips can all be planted early in March, lifting them when ripe. Many Lilies can be planted in February and March, lifting them when ripe and wintering them in boxes of moist peat. Biennials and half-hardy plants can be raised the previous season, or the same season in heat. Marguerite Carnations, hybrid Aquilegias, Foxgloves, Portulaccas, Antirrhinum, Annual Chrysanthemums, Asters, Stocks, Sweet Williams, Canterbury Bells, Petunias, Coreopsis (annual and perennial), Salpiglossis, Sweet Scabious, Sweet Sultan, Indian Corn, *Dianthus Heddewigi*, Annual Phlox, Verbenas, Aubrietias, *Campanula pyramidalis*, Eschscholtzias, Iceland Poppies, Tufted Pansies, Evening Primroses, Sweet Tobacco (*Nicotiana sylvestris*), Forget-me-not (*Myosotis dissitiflora*), *Gypsophila paniculata*, Tagetes (African and French Marigolds), *Celsia cretica*, Mulleins, and *Anchusa italica*. Few annuals succeed, the best being Nasturtiums, annual Larkspurs, and annual Monkshoods, with Godetias, Shirley Poppies; and Cornflower will do sown the previous September for transplanting; Paris Daisies, Salvias, Ivy-leaved Geraniums, Heliotrope, Fuchsias, Geraniums, and Pentstemons, to be struck from cuttings and wintered in a cool frame. *Trees:* Copper Beech, Silver Maple, Golden Elder, Weeping Ash, red and pink Hawthorns, Japanese flowering Apples, double white and pink Cherries, red Horse-Chestnut, and Laburnums.

USEFUL GARDEN TOOLS

Dibble, Dutch or push hoe, common or draw hoe, and rake. Necessary summer tools.

"As *Creepers*, cut-leaf and other Blackberries, type Clematises, on their own roots, white Everlasting Peas, Kentish Hops, Virginian Creepers, Honeysuckle of kinds, and hardy single Roses and Ivy; Pampas Grass, Guelder Roses, Weigelas, Rugosa, or other single hardy Roses on their own roots. Sweet Briars all do as bushes. Mock Oranges, Ribes of kinds, Forsythia, Lilacs, all these will do."

Garden Tools. — These must be of various descriptions. Spades, forks, hoes, rakes, picks, knives, saws, shears, scythes, rollers, wheelbarrows, water-pots, and many other things. But once purchased they should always have a place to themselves, where, having been well cleaned after being used, they can be hung up or otherwise stored. It is surprising how little space tools need. When on hooks, or large nails, they can be hung up round a shed. A shed made with a wood frame, and coated with corrugated iron, does not cost much, and is very enduring. It may even be large enough, if near the greenhouse or frames, to be used as a potting shed also. All tools should be kept quite clean, as then they work more freely and last longer. Always leave water-cans upside down after use. Give barrows, pots, &c., a coat of paint occasionally, as it pays in the end. Keep one large pruning knife for rough work, and a small one in the pocket for common use.



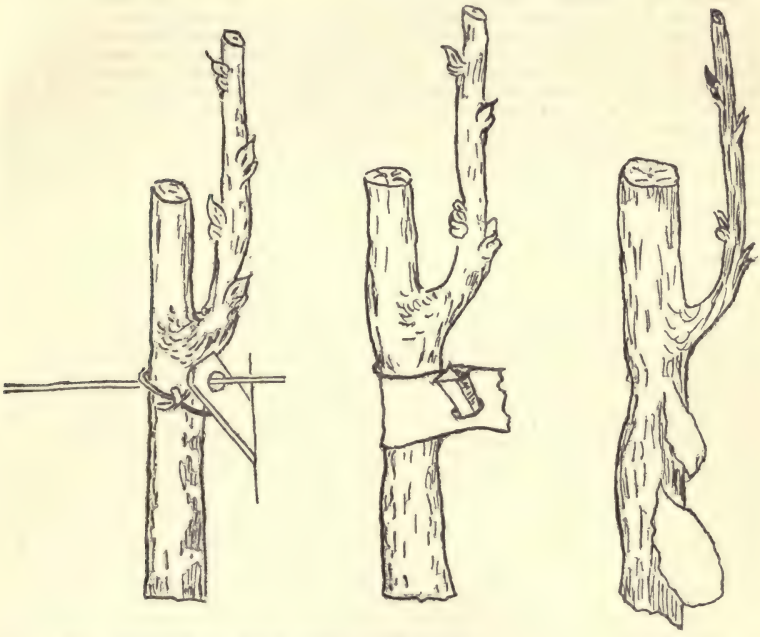
RAKE AND DRAW HOE WITH LONG HANDLES. ALSO DIGGING SPADE AND NARROW TINED FORK

Greenhouse Fires.—Where there is a greenhouse, some means of heating it to exclude frost in winter is essential. Gas or oil lamps are temporary and poor means for warming a greenhouse, often failing, and the foul gases emitted are most harmful to the plants. The best provision is found in a small boiler fixed in the wall of the greenhouse at one end, the furnace door by which it is fed being outside, and protected with a small corrugated iron sheet to ward off wind and rain from the fuel. If to this boiler be attached inside sufficient length of 4-inch piping, it is easy then to get up a nice warmth, and with proper attention to maintain it through the night, especially in hard weather. All these boilers are best fed with fuel of one-third small coal, the rest being finely broken coke and house cinders. Always loosen the mass of fire perhaps once in two hours, adding fresh fuel, especially before going to bed, when the fire should be well banked up.

Gumming.—Gumming on fruit trees is practically confined to those producing stone fruit. Peaches, Nectarines, Plums, Apricots, Cherries, and Almonds are all prone to it, and the intelligent cultivator dreads its appearance on the trees named almost as much as an outbreak of canker in the Apple orchard. Fortunately, however, it does not spread rapidly from tree to tree as canker does, though it is equally difficult to eradicate when once it puts in an appearance.

Its appearance at times is most puzzling, even to experienced growers, as, knowing what conditions are likely to produce gumming, measures are taken to arrest it. This is not so, however, with the amateur or young gardener. The latter especially often undertakes the management of a valuable lot of trees either growing against walls in the open or under glass. A few errors on his part in the cultural details may lead to much trouble, if not the total loss of valuable trees, through the excessive exudation of gum from the main stem or branches.

One of the most fruitful sources is the too free use of the knife. Trees which produce



EVIL EFFECTS OF WIRE AND TIGHT SHREDS GUMMING

stone fruit resent hard pruning more than either the Apple or Pear. Under proper treatment pruning can and should be reduced to a minimum. This in the first instance is accomplished by properly disbudding the branches, and secondly by preventing the formation of gross shoots. Rank-growing trees are more subject to gumming than those which make medium growth and carry full crops of fruit annually. To severely prune the former only makes matters worse. The fault can generally be traced to the border, unless through some mishap the crop fails, and there is not the strain of fruit production to balance growth. It is the roots, therefore, and not the branches that must be dealt with. A firm and rather shallow rooting medium favours the formation of short-jointed, healthy fruiting wood, support being afforded as the trees require it. Deep rich borders of loose formation and overcharged with manure encourage soft strong shoots which seldom become matured by autumn. With outdoor trees such unmatured wood is easily injured by frost, and its effect is readily noticed the following spring, first of all by the discoloration of the bark, forming patches of red here and there. These eventually turn

black, the bark dies, and this is generally followed by the exudation of gum. From this it would appear that the sap vessels having been ruptured, strangulation at that point results, and the growth above, being cut off from further support, perishes. In the case of strong growing trees lift them and rearrange the roots, bringing the latter nearer the surface. Place fresh strong loam about them, the only addition required being old mortar, and then ram the whole firm.

Although, as pointed out, gumming may be the result in the first instance of indifferent root action, coupled with what may be termed frost-bite, it generally follows wounds or abrasions of the bark. How do these abrasions occur? Seeing the evil which follows, how careful one should be in avoiding them.

A wound to the bark is easily produced by the use of shreds that are too short, and which will not allow for the free swelling of the various shoots for at least a year. No part of the tree should ever be allowed to press hard against the brickwork. Look over the trees frequently during the growing season to free any shoot that is likely to become too closely encircled by the shreds or matting.

Hedges of Flowering Shrubs.—It often happens that some kind of hedge is wanted in a garden, either as a screen to hide vegetable ground, or as a wind break or some kind of partition. When this is the case it is a good plan to plant hardy flowering shrubs about 4 feet apart, and so to train them that they grow into a compact hedge, and yet have enough lateral play to allow them to flower. Such a hedge is not only ornamental, but it yields endless material for cutting. It should be allowed to grow quite 4 feet thick, and is best formed with a backbone of stiff woody shrubs, such as Guelder Roses, Ribes, and Lilac, while between the stiffer shrubs might be some that are weaker, such as Kerria, Rhodotypos, and Leycesteria. Plants of rank, rambling growth, such as the free Roses or double-flowered Brambles, Aristolochia, Wistaria, Virginian Creeper, and the rambling Honeysuckles, are not in place in such a hedge; they are more suitable for rough hedge banks, walls, or for arbour and pergola; the flower hedge wants true shrubs. The *bush* Honeysuckles, such as *Lonicera fragrantissima* and *L. tatarica*, are just right, or any woody, twiggy bushes either of moderate growth, or such as are amenable to pruning or thinning, such as Deutzia and Snowberry, shrubs that so often get overgrown in a shrubbery. In the hedge these would do well, as they could be easily watched and thinned, also any of the many true shrubs that flower all the better for reasonable pruning. Any one would be surprised to see what a quantity of useful flowers such a hedge will yield, while if there is another of foliage for winter use it will be invaluable to the indoor decorator, using such shrubs as the Scotch Golden Holly, Golden Euonymus, Golden Privet, the variegated *Eurya latifolia*, yellow variegated Box, *Cassinia fulvida*, and Golden Tree Ivy, all shrubs of the utmost value for winter cuttings. Other flower hedges are delightful possessions. Hedges of China Rose, of Sweet-briar, of old garden Roses, or of climbing and rambling Roses trained down, of Honeysuckle, of Jasmine—some of these are occasionally seen; but a good selection of true shrubs hedges is rarely, if ever, made. Any of the shrubs recommended for the mixed flowering hedge could, of course, be used alone, and excellent would it be to have a hedge of Guelder Rose, or of flowering Currant or Japan Quince, and how much more interesting than the plain hedge of Quick or Privet or Holly. Both sides of the hedge should be easily accessible; not necessarily by a hard path, but by a space just wide enough to go along comfortably. An additional advantage well worth considering would be that, supposing the direction of the hedge was east and west, the south side would flower in advance of the north, and so prolong the supply of bloom.

Labels.—Everything sown or planted in a garden should be labelled, such as all varieties of Apples or other fruits, of Dahlias, Roses, Carnations, and other things individually, and Peas, Potatoes, Cabbages, &c., in the bulk. Labels may be made easily from stout laths rent for plastering, as these need little preparation. A bundle of laths 3 feet long will make hundreds of labels, from 4 inches, wired on to trees or roses, up to 8 inches, for vegetables. First cut them into proper lengths, then pointed one end, if to be put in the ground, doing that with a sharp knife, and facing off both sides flatwise quite smooth. A little thin white paint may be well rubbed over a few inches of the top of one side, and the name be written with pencil whilst the paint is wet. It then soon dries, and the writing will remain clear as long as the label endures. These wood labels should be prepared by the fireside in the winter. If metal labels are desired, the best we know are the "Acme."

Making a Hot-bed.—In making a hot-bed, either for forcing vegetables, growing Melons or Cucumbers, or raising annual flowers, the first thing to be considered is the preparation of the materials. These should consist of leaves and stable litter in equal quantities, and be thrown into a heap and turned over several times at intervals of three or four days to allow the steam to escape. If the leaves or litter are too dry, make them thoroughly moist by sprinkling water over them. Thus prepared the material will retain the heat for an indefinite period. Secondly, the dimensions of the bed should be marked out,

and allowance made for a 2½-feet pathway all round, after the frame is placed on. Stout stakes should then be driven in at the four corners to serve as guides when the bed is being made, after which place a layer of the material along the sides and ends of the bed, in a direct line with the stakes, and then proceed with the interior of the bed. As each moderate layer of leaves and litter is added, let it be trodden very firmly, as if left in a loose condition the bed will soon lose its heat, and also be liable to tilt on one side when the frame is placed on. The sides and ends must be well trodden and beaten with a fork, or they will collapse when walked upon later. Beds which are made very early in the year should be 4 feet high at the back, and 3 feet 6 inches in front, while those made later may be 6 inches less in depth. A good fall from back to front must be allowed, so that a maximum amount of sun heat may reach the interior of the frame. As soon as the bed is finished the frame may be placed on and the soil thrown in, after which some clean straw litter should be laid round the frame on the bed to give a neat appearance.

Making a Pergola.—The pergola, or covered way of green growths, has come to us from Italy, and is frequently seen in English gardens. In Italy it answers the two purposes of the best way of growing Vines for fruit, and of affording pleasant shade over paths. Even in England, though Grapes will only ripen against a wall, the Vine is still the best and most beautiful covering for these pleasant, shady ways, and with other quick-growing climbing plants, such as Aristolochia and Roses, will soon cover the skeleton of the structure, and give the cool shade that is so pleasant in the heat of full summer. The pergola may be entirely of wood, preferably of oak, stems about 9 inches in diameter, and left quite rough. The bark must not be stripped off. Where expense is no object it is better that the supports should be of something more durable than wood. Nothing is better than piers of 14-inch brickwork, standing 7 feet 2 inches out of the ground, with sound beams of oak coupling them across the walk, and larch poles or branching tops of oak laid along overhead. There are also some small trees that will soon cover a pergola, such as Laburnum and Weeping Ash. These two, if grown together over a temporary larch support, would in time take its place altogether. In quite small gardens rough arches of oak across a path are pretty, and provide opportunities for the growth of climbers; but never use galvanised iron frameworks or anything of a cheap "rustic" character. Simplicity should be the watchword.

Mulching.—This is a term understood by practical gardeners as a dressing of some other material placed on the surface of the soil about plants, trees, and similar things to check waste of moisture when, either after watering or after rain, or at any time hot sun beats fiercely on the soil, and makes it hot so that it dries rapidly. To prevent that the gardener, whenever he can, places about the things he has to water, or between and about garden crops or fruit trees or other things, a layer of manure containing a good portion of straw; or failing that, cocoa-nut fibre refuse or decayed leaves, as these catch the sun's rays and protect the soil, thus keeping moisture in it. Under waterings or rains the manurial properties in the mulch also will wash in and assist to feed the crops or trees. Fruit trees on walls and Vines specially benefit by mulches of manure.

Nails and Shreds.—Every gardener (the term is used in its broadest sense) has occasion to nail fruit trees or climbers to walls or fences. The best nails for brick or stonework are those of the ordinary cast-iron form, as these do not bend, and can be driven into very hard material. When old ones are drawn from a wall they should have a partial turn or twist given to them with the hammer claw or pincers first, as that preserves the point and frees them from mortar. Nails that have lost their points are of little use, and should be thrown away. Old nails with hard mortar still adhering are best cleaned by putting them into an old shovel and burning them in a fire, as then they are quite fit for use. Shreds should always be made of clean, even if old cloth. They may, according to the size of the shoots they are to secure, range from half an inch to an inch in width, and be from three to even six inches in length. Old shreds may be full of insect eggs or fungoid spores, and should be burned at once.

Old Trees and Climbing Roses.—It is a mistake to destroy old trees because they are worn out. A tree is frequently picturesque in its old age, and seems to invite some beautiful flower to clothe its bare, knotted stems with beauty. Roses will provide the flowery dress. A very useful note appeared in the *Garden* lately upon this question of clothing old trees with Roses. The writer says: "Should there be an old orchard with ancient non-bearing trees, it is a good plan, instead of doing away with them altogether, to use the old trunks as supports for Climbing Roses. The boughs should be shortened and the Roses allowed to climb up and fall over the sprays in as natural a way as possible. There is something about old Apple trees that Roses seem to like, and the combination has in a short time a charming effect. I had some Roses planted in this way two years ago which have mounted to a height of 15 feet to 20 feet. My experience is that if you wish to be successful with Climbing Roses you must let them grow freely and pretty much as they like, using the pruning knife but very little. Train them carefully, and be sure and give them a plentiful supply of farmyard manure-water during the spring and summer months.

In giving them manure-water, take pains and make certain that it reaches the roots. I find a good plan is to first carefully remove the surface soil round all the trees, making a hollow, holding about 2 gallons. If the ground is very dry, I go all round and give them clean water first, then go back to the first tree and give them the manure, and, when I have finished with that, some more clean water." Any of the Climbing Roses mentioned in the lists will suffice for this purpose; they should, however, be the more vigorous kind.

Ordering Seeds.—All seedsmen issue lists of their seeds, and one of these lists can always be had on application to the trader. It is good policy to obtain two or three lists, one especially being from some first-class firm, because new things are more likely to be found in such a catalogue. Of these novelties purchase a few yearly to try them. Some will give great pleasure, some will be disappointing. Always look carefully over the lists, write out clearly on paper what is required, and order in good time, that is, several weeks before sowing, as it is so useful to have the seeds at hand when wanted. Do not order more than sufficient, as too liberal a quantity tends to encourage thick sowing. Potatoes may not be sent out in hard weather, but seeds may be got in at any time. Be careful to keep them dry.

Packing Flowers.—The best way to pack flowers is to wet some moss and wring it out in the hand, and either tie it on to or lay it loosely but firmly among the stalks, and envelop the whole in some large fresh leaf like Cabbage, Rhubarb, Spinach, Lettuce, Dock, or even Ivy. If the box is larger than the space the specimens actually occupy, it is well to fold the green leaf over the flowers, and to fill the rest of the space with crinkled paper of any kind, wood or paper shavings, or any such material, in order to keep the flowers quite firm, and not allow any movement whatever. It is much better to pack very tight, only short of crushing, than to leave any space which would allow them to move. It should be remembered that a postal journey is a train journey, and that the unceasing vibration means a constant grinding of any surfaces which may be in contact with each other. Only tight packing prevents injury from this cause. In all such packing exclusion of air is also of the utmost importance, and therefore tins are the best kind of receptacle. There is generally a Cabbage leaf in the kitchen, and there is often only too much ivy on the house.

Plants for Rooms.—No book upon gardening intended for the beginner would be in any sense complete without a chapter upon Window and Room Plants. Many lovers of flowers have no greenhouse or even garden to pursue their pleasurable inclinations, and it is then the room becomes the indoor garden, where those things that will succeed in this atmosphere are grown in as great a variety as possible. Dwellers in "flats" usually lighted by electricity not by health-destroying gas, may brighten their apartments considerably by judiciously selecting a few good things. At present room gardening is not always successful. There are more failures than successes, and unless certain golden rules are unfailingly observed, it is hopeless to expect plants to live for more than a few weeks, whereas with correct treatment their life would have been of considerable duration. It is very easy to deal with insect pests, as the plants are under close and constant observation, but the failures may be attributed to injudicious watering, draughts, foolish applications of violent fertilisers, and dust. There are others, and one of them is not purchasing the right sort of plant. Things forced in heat merely to sell, glistening green-leaved india-rubber plants, glossy palms, and so forth, are invariably a failure. We have no wish to say hard things about the hawker, but he buys from the marketman, who puts things in the market in the pink of perfection by unnatural forcing in heat. So go to a good nurseryman who has grown the plants in about the same temperature as the room, then success, with correct after-treatment, may be expected. It is a mistake to buy at all in the winter, unless, of course, for temporary decoration.

Draught is a fruitful source of failure. The plants are stood about the floor in the draught from doors when cleansing operations are going on in the early morning, or the windows are left open, and the foliage flutters in the keen early wind. All this means that in time (not very long) the deep green of the leaf changes to brown, and plant growing is given up in disgust. Then in the winter frost attacks the plants. The temperature drops far below freezing point in an unwarmed room, and the plants in the window have an unhappy time, even in a room used during the day. Never fail to bring the plants into the centre of the room when a sharp frost is expected, and this may be easily managed with an iron or strong wire stand. Never leave the door and window open at the same time or allow cold draughts to blow upon the plants.

In large towns constant attention is needful. Dust accumulates on the foliage, especially in the case of thick-leaved plants, such as the Aspidistra or Parlour Palm, *Aralia Sieboldi*, Palms, and similar things. Free the leaf surfaces from dust with a bit of sponge moistened in tepid water. Unless this important duty is frequently attended to it is hopeless to expect healthy plants. Dust chokes up the pores and suffocation ensues.

Water should always be *tepid*. A fruitful cause of failure is cold water, which chills the roots, hinders growth, and eventually kills the plants. This may seem a trivial matter; it is not so. Good room and window gardeners use water of the same temperature as the apartment. It is also wise to let the water intended for the plants remain in a vessel in the open air to soften, and where rain water can be used this is better than that from tap or well. Never over or under water. The soil should be kept in an equal condition of moisture, and when watering give a good dose at each application, so that it runs through the drainage and out of the hole in the bottom of the pot. In summer and warm spring days the plants receive considerable benefit from pleasant showers, soft, gently falling rain, not violent downpours.

Of course a greenhouse is an immense help to the room plants and flowers. When the latter become out of health, take them to the purer air of the greenhouse, and under more natural conditions, and especially after they have been repotted. The greenhouse is also a nursery for bulbous flowers and other things as pointed out in the chapter about greenhouse plants.

When potting room plants, remember it is most important to restrict the size of the pots as much as possible. Palms are frequently happier with their roots cramped in a pot than when allowed greater freedom, and disturbance at all is seldom necessary. We have Palms that have been in the same pots for years. The soil is top-dressed once a year, and during the growing time a little weak liquid manure is given. With regard to soil the information given in the chapter upon greenhouse plants applies here.

There is one point often forgotten, and that is of giving during the growing season a little stimulant or "artificial manure," such as Clay's. Use this manure strictly according to directions, not a least bit over, as it is powerful, and, like medicine given in excessive doses, inflicts considerable injury. We have known plants killed by the excessive use of artificial fertilisers. Soot water is excellent, and is easily made by putting soot in a small sack and letting it soak through in a tub of water. Soot is useful to give in the spring, and makes the foliage of deeper colour.

The majority of insect pests may be removed with a tiny brush or with the hand.

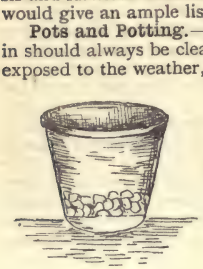
A list of the best foliage and flowering plants for rooms is given in the tables at the end of the work.

Planting and Sheltering an Exposed Flower Border.—In dealing with a border of this kind, and there are many similar positions in English gardens, we should advise, in the first place, a careful planting of one of the best of our native evergreens, either Yew or Holly. Which of these two it would be wiser to use should be decided by observing which appears to be more vigorous in the neighbourhood. Both are slow of growth at first, but grow fast when well established. In an exposed place no pains should be spared to make this shelter planting effectual. Then you must have shelter shrubs. *Pyrus Malus floribunda* is very hardy, flowering when quite young. Lilacs are amongst our hardiest shrubs, flourishing even within the Arctic circle. Double Thorns would also do, the double white being far the best. Laburnums also do well. Wistaria is hardy, and is beautiful grown as a Standard, as is also Philadelphus (Mock Orange). It should be remembered that all shrubs that are amenable to the standard form give much more bloom. Brooms are hardy and beautiful, and there are many kinds to choose from. With these, or even a smaller selection of them as a sheltering background, nearly all the best known border plants would succeed.

Planting a Steep, Sunny Bank of Poor Soil.—Amateur gardeners are often at a loss to know how to deal with such banks as this, and the following hints may prove helpful. In the latitude of London and the large portion of England that is to the south of it, many of the shrubs and plants of the Mediterranean district succeed well on banks in poor, warm soils that are naturally well drained, and receive the full heat of the sun. Conspicuous amongst these are the hardier of the Cistuses, Rosemary, Lavender, Santolina, and Phlomis, all the Brooms, the sand-loving, bluish grass (*Elymus arenarius*), the Eryngiums or Sea Hollies, a large range of aromatic herbs such as Thyme, Marjoram, Catmint, Furze of kinds, Broom, Lycium (Boxthorn), Alstroëmerias (Peruvian Lilies), Brambles, not forgetting the pretty cup-leaved *Rubus laciniatus*, the Japanese Wineberry (*Rubus phœnicolasius*), picturesque in growth and in fruit, and with slight preparation, the Japanese Rose (*Rosa rugosa*), and the Scotch Briars. The situation is also favourable to the hardy Opuntias of recent introduction. Such a place also shows to great advantage several plants that are commonly grown as climbers up walls or other supports, and that are quite as beautiful rambling at will over the ground. Amongst these would be *Clematis montana*, which is of extreme vigour, and bears a wealth of white flowers in spring, *C. Flammula*, *paniculata*, *graveolens*, and the Old Man's Beard or Travellers' Joy (*C. Vitalba*). Many of these Clematises are as beautiful when in seed as in flower. Every lover of the open knows how charming is the hedgerow in autumn when the Travellers' Joy covers it with its foamy seed tassels. Upon this bank could also be placed Everlasting Peas if the soil is prepared deep enough for their great roots. Othonnop-

sis and *Arnebia echioides* (Prophet Flower), the native and other heaths. These plants would give an ample list for a very large space of ground.

Pots and Potting.—Flower pots or pans used for growing plants of any description in should always be cleaned before being employed. If they are new, and have not been exposed to the weather, dip them in water twenty hours before they are used, as quite new pots, not so treated, often absorb much moisture from the soil. All that have been used should be thoroughly washed, and, if green, scrubbed clean in strong hot soda water and well dried before they are again used. What are called crocks or drainage usually consists of such split or broken pots as are invariably found where flower-pots are used. If there are, however, few of these, some soft red bricks broken up, not too finely, make good drainage. One rather flat piece of crock or potsherd should always be placed over the pot hole, and on that from half to one inch of broken rubble, large or small, according to the size of the pot. Still it should not be overdone. In filling with soil put on to the crocks a few of the coarser pieces of the soil first, as the finer soil is then prevented from washing into and choking the rubble. Always use a proportion of one part in ten or so of sharp white sand with potting soil.



POTTING A PLANT

Rabbit Proof Plants.—It is not easy to compile a list of plants that rabbits refuse to touch, for these pests to the gardener will consume almost anything. Plants, too, that rabbits refuse to touch in one neighbourhood, because doubtless of an abundance of more appetising food, are devoured wholesale elsewhere; and whether the winter be mild or severe is another point, in truth during a very hard winter everything practically is consumed. The following plants, however, are not favourite food for the rabbit:—Azaleas, Rhododendrons, Spurge Laurel, the Sabine or Juniper, Furze, the Forsythias, *Jasminum nudiflorum*, Tree Pæonies, the Snowberry (*Symphoricarpus*), Butcher's Brooms (*Ruscus aculeatus* and *R. racemosus*), Boxthorn (*Lycium barbarum*), Spindle Tree (*Euonymus europæus*), Privet, Yuccas, Hydrangea Hortensia, Wig or Smoke tree (*Rhus Cotinus*), Box, and the Hibiscus (*H. syriacus*); hardy herbaceous plants, Flame-flowers (Kniphofias, better known as Tritomas), Irises, Winter Aconite, Daffodils, Solomon's Seal, Lily of the Valley, Periwinkle, Aquilegias (in variety), Dog-tooth violets (Erythroniums), Scillas, Delphiniums (Perennial Larkspurs), Primroses, Anemones, Aubrietias, Violets, Canterbury Bells, Foxgloves, Poppies, *Cineraria maritima*, *Stachys lanata* Muscari (Grape Hyacinth), and Arabis.

Repotting.—This means the changing of a plant from a small pot into a larger one. The larger pot should not, as a rule, for all ordinary pot plants exceed the smaller sizes by more than one size or two at the most, that is to say, if the smaller pot be a 48—that is, selling at 48 to the cast—it will be 5 inches across the top inside measurement. A good shift is into a 6-inch pot or 32, or it may be needful to transfer the plant to an 8-inch pot or 24 size. The plant is easily removed from the small pot by turning it upside down, resting on the left hand, and with the right hand taking hold of the inverted pot. Give the edge a sharp tap on a table or potting bench. The plant then slips out from the pot at once. In refilling, first remove from the ball of roots all drainage, as the new pot should be provided with fresh drainage before the plant is put into it. In the case of a very hard ball, some of the soil may be removed with a pointed stick first. Then repot, not deep, but firmly.

Seed Sowing.—How few persons, even those who have long been gardening, seem to understand the proper way to sow seeds. Almost every one, and amateurs especially, sow seeds far too thickly, with the result that they commit a double fault, for not only are seeds wasted, but much extra labour is created in thinning the seedlings. Such seeds as vegetables and annual flowers are generally sown fully three times too thick, as the great thinning needful shows. Plants in their seedling stage are so crowded that they are often strangled in their birth as it were. Seeds sown in pots, pans, or boxes under glass need the same care in not sowing too densely. It is much better when plants have to be transplanted to give them the chance of becoming strong before the change is made. Heavy seed sowing benefits the seedsman at the expense of the gardener.

Shelters.—A very useful hint was given by Mr. G. F. Wilson of Weybridge in the *Garden*, of March 17, p. 197, when he wrote that: "Part of the garden at Oakwood, Wisley, before some Poplars grew up, was much exposed to high winds, and for some plants we wanted shade, so the question of shelter from wind and sun had to be considered." After describing some methods which were scarcely satisfactory, Mr. Wilson says: "We at last arrived at a shelter which, we think, practically answers every purpose, and is easily portable. We have a great many of these sort in use and have thoroughly proved them. The iron hurdle is five barred; it stands 3 feet 6 inches out of the ground, and is 6 feet wide; 3-feet common laths are tied by tarred string to the

hurdles, two sets, one above the other, overlapping about 9 inches. This gives stability and a height of shelter of 5 feet 3 inches, which is enough for most purposes. One cross piece is put above the hurdle to stiffen the laths. The laths do not touch each other, so air passes through them. The whole shelter, iron, laths, and twine is well painted over with that varnish which we get from Hill & Smith, of 118 Queen Victoria Street."

Sowing Seeds in Concrete Walls.—A rough concrete wall is naturally not the best place for sowing seeds in. As much loamy soil as possible must be got into the crevices, and it would be well to mix the seed and soil and work them in together. Autumn is a good time for this work, so that the young plants would be getting a good hold in making that slow but strong winter growth that seems so good a preparation for vigour in the coming year. The following would be advisable :—

Alyssum saxatile
,, serpyllifolium
Antirrhinum (Snapdragon), asarina and majus, vars.
Arabis alpina
Armeria vulgaris (Thrift)
Centranthus ruber
Dianthus cæsius (Rock Pink)
,, deltoides
Draba aizoides
Iberis tenoreana
Iberis sempervirens
Sedum Aizoon
Tunica Saxifraga
Aubrietia græca
Campanula rotundifolia
Cerastium tomentosum
Corydalis aurea
Iberis correæfolia
,, gibraltarica
Saponaria calabrica
Sedum anglicum
,, glaucum
Wallflower

Sweet Briars as Exposed Hedges.—The Common Briar makes an excellent hedge. It is very hardy, and as the plants are raised from seed there is no trouble from wild suckers, such as one experiences now and then with budded plants of Lord Penzance's hybrid Sweet Briars, which make delightful hedges. The most brillant crimson is Anne of Gierstein. Other good kinds are Amy Robsart (pink), and Lady Penzance (coppery yellow) ; the last mentioned is not quite so free as the others. All have fragrant foliage, and produce showy fruits in autumn. The Sweet Briar revels in a good, deep loamy soil, inclined to clay, but before planting the ground must be trenched, incorporating with the soil well-decayed farmyard manure, and a little old mortar and burnt garden refuse if procurable. Plant between October and April. Do not plant very large bushes of the Sweet Briar. Those from 2 feet to 3 feet in height are strong enough. One year after planting cut them down to within 12 inches or 15 inches of the ground ; the subsequent treatment consists in removing dead and crowded growths in autumn, and pruning rather severely three or four years to induce strong, new growth. A good watering now and then during the summer with diluted stable or cowyard drainings forms an excellent stimulant for these and other Roses used as hedge plants.

Spraying.—There is considerable difference between syringing and spraying plants. Syringing cleanses and refreshes the foliage, and the instrument used is a large force squirt. This drives the water either in one stream from a nozzle, or breaks it up into many tiny streams through a broad perforated nozzle called a rose ; the smaller and more numerous these holes the finer the tiny streams. When it is desired to refresh foliage, the latter nozzle should be used to allow the water to fall on the plants like gentle rain. When plants are dirty and need washing, then the other nozzle must be used, and the water driven on to them with great force. Spraying means the casting of moisture on to plants like dew, and is advised when, because of mildew or insect attacks, it is needful to suffuse the leaves with some liquid remedy of a chemical nature. A proper spraying syringe, such as the Abol, with its curved nozzle, sends the liquid over the plants practically like vapour, and it does not run off them.

Treatment of Sloping Banks in Garden Ground.—No feature is more frequent in gardens, whether large or small, than a change of level necessitating a flight of steps. The change of level, if not retained by a wall, usually has for its fate the steep turf bank, unbeautiful, awkward to mow, and in all ways a very "bad second" to the better way of treating it as a slope planted with suitable bushy growths. *Cotoneaster microphylla* is a most suitable dwarf shrub for this purpose, but only one of many that can be used in like manner. Such a bank planted with Savin (*Juniperus Sabina*), an evergreen of deep, low-toned colour, that accords with the most dignified of masonry, would always, winter or summer, clothe it well, and be pleasant to see. The late Dutch Honeysuckle, though not evergreen, is also a capital thing, for its masses of growth, interlacing in a kind of orderly tangle, are by no means unsightly in winter. For banks of large size there is *Pyrus japonica*, the free-growing Roses, or the double Brambles. For hottest exposures there are the Cistineæ (Cistus and Helianthemum) ; while some of these and other sun-loving plants, such as Phlomis, Rosemary, and Lavender, can be used

in mixtures. A beautiful combination is of the common evergreen Berberis (*B. Aquifolium*), and *Forsythia suspensa*, the yellow bloom of the free-arching Forsythia coming while the Berberis is showing its own yellow bloom, and still holds its leaves of winter red-bronze colouring. Ivy and St. John's Wort are obvious plants for such use, but their monotony makes them less desirable than the more interesting treatment of shrubs with low or spreading growth. Scotch Briars are also excellent for this kind of planting, while if the bank occurs in a shady spot, or has a cool exposure, it will be a good place for hardy ferns.

Tying Up.—It is impossible to garden long without realising that much tying up is needful. Thus, Cos Lettuces may be all the better if loosely tied round to help them to form hearts; broad-leaved Endives tied up to cause them to blanch; Celery just before it is earthed, loosely tied up to enable the earthing to be neatly done; Carnations; all tall growing flowers; Dahlias, Chrysanthemums, and many similar things, with climbers, to sticks or tree stems, or trellises, &c., and especially of plants of various descriptions in pots in the greenhouse. Neat sticks or stakes or bamboo rods are admirable for these, but the best tying material is soft, tough raffia grass, which in a dry prepared state may be purchased cheaply from seedsmen. This should not be used wastefully, but with care, and when tied leave the ends short and neat. In many cases worsted or wool or twine may be used, and sometimes coarse, soft tar cord. But for all soft wooded plants the raffia is much the best.

Winter Protection for Outdoor Flowers.—It is well worth while to provide suitable shelters for the few outdoor flowers that we have in midwinter. Of these one of the most important is the Yellow Jasmine, so usually grown against walls, palings, or sheds. Either the rot-proof Willesden canvas or a stout quality of the same scrim are excellent materials for protective coverings. It is easy to have a sheet of this for each section of wall or space where it is likely to be wanted, and well worth the trouble of the slight preparation needed for taking on or off quickly. If the sheet has a strong tape or webbing sewn to the top and a few stout rings, and the wall is provided with corresponding hooks, it is soon put up and taken down, and is easily folded up when out of use. If several of the sheets are in use, it saves much trouble to have them numbered; best by painting in white or grey a 3-inch square patch in one top corner, on which, when dry, a number in darker colour is painted, also painting the same mark on the wall; then there is no fumbling about or loss of time in finding out which sheet is for which place. Contrivances for keeping the sheets down in windy weather will suggest themselves to intelligent persons, but the great thing is to have the protection at hand. A number of hurdles thatched with straw, or reeds, or heath are always of use to be put over Christmas Roses, or Czar Violets, or *Iris stylosa*. The sweet bloom of any Chimonanthus trained to a wall shrivels and is spoilt in severe frost, but may be saved by hanging over the bush some boughs of Spruce or Scotch Fir. If the protecting boughs are hung up by their stem ends they are easily lifted or moved aside so that the flowers may be picked.

Watering.—Much judgment is needed in learning how to water plants or crops properly. Plants in pots are best when occasionally allowed to become root-dry, but only just for the moment, as the drying of the soil sweetens it. But if dry long the plant flags and suffers, and that should not be the case. Then the soil should be well saturated, giving sufficient water to fill the pot to the top and even twice filled if needed. Where, however, soil seems moderately damp then do not water but miss that pot. Too many people water all alike and seldom stop to consider whether it is proper or not. Outdoors remember that as a rule roots go deep, and that in dry weather it is better to give a thorough soaking once a week rather than a moderate watering, which only moistens a few inches deep. After such good watering either cast some dry soil over it to prevent rapid evaporation by sun heat, or put on a mulch of long manure or cocoa-nut fibre refuse.

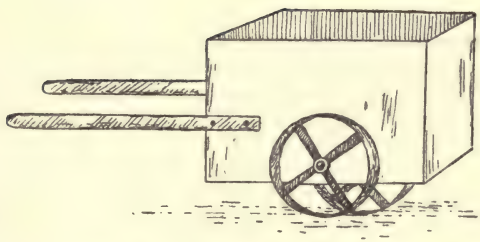
Window Boxes.—This is a familiar form of window gardening. At one time the Wardian case was very popular. When the "box" is merely a strip of board tiled or coloured in some way, pot plants are intended to be used; that means, of course, shrubs or flowering things purchased or grown in the greenhouse for the purpose. But well-drained boxes of soil, such as one would put a Geranium in, are suitable for the growth of many plants and bulbs. Daffodils, Tulips, Scillas, Chionodoxes, Snowdrops, &c., are pretty for the spring, planting them the previous autumn. We have seen, too, the exquisite early-flowering Irises grown in this way by an enthusiast who had no suitable place in the garden, but would not be without his cherished bulbs. The Netted Iris (*I. reticulata*), a full violet purple and filled with strong violet scent; *I. bakeriana*, and the little yellow *I. Danfordiæ* may be grown in this way. Of course, this form of gardening is not for the usual run of flower lovers. They must place their faith in the Musk, the Periwinkle, Creeping Jenny; and for temporary effect the Zonal Pelargonium or "Geranium," Fuchsias, Petunias (very free-blooming and bright flowers, even in quite hot positions). We must

point out the importance of the quite dwarf things, the Mossy Saxifrage (*Saxifraga hypnoides*), the large, white-flowered *S. Wallacei*, or Stonecrops, and these look well with bulbs planted between.

During winter make good use of quite dwarf evergreen shrubs, such as *Cryptomeria japonica* (a Conifer), but better still Aucuba, Box, or Laurel, as Conifers, in places near towns, fail completely.

When the position is very sunny the soil dries in the pots quickly, and constant attention will be needful, not forgetting also the importance of stimulants occasionally.

Wood Frames.—Frames of moderate size and having glass lights for tops are most useful in gardens. Although not generally available for forcing except on dung beds, they are excellent to raise seeds in, to winter many fairly hardy plants, such as Lettuces, Cauliflowers, Cabbage, Radishes, &c., and to plant out Potatoes in March for early cropping. Also may be wintered in them many fairly hardy plants, especially if covered up with mats or sacks, during hard frosty weather. Where stable manure can be obtained and hot-beds made up in the spring tender seeds may be raised in a frame, cuttings rooted, or Cucumbers grown on. Frames of this kind should be kept very clean, and especially the glass, and all the woodwork should receive a couple of coats of paint every two years at least.



A SIMPLE AND USEFUL GARDEN BARROW

Commonly made of a sugar-box, 16 inches wide, 20 inches deep, and 24 inches long, set on wheels with handles affixed. Most useful for carrying manure, &c.

INSECT PESTS AND WAYS TO DESTROY THEM

However carefully and judiciously we may cultivate our gardens by growing the plants most suitable for the soil, and placing them in the most favourable situation for their growth, we still have to reckon with a host of insect pests that are almost certain to infest them. In spite of all our care, there is no doubt but that plants grown in favourable circumstances and in robust health are less liable to the attacks of insects and fungi than those which are unhealthy and not in a vigorous condition, but still they are liable to be attacked. It is impossible on the present occasion to describe all the various insects that injure plants; but that is not really necessary, as the great thing from the gardener's point of view is to know how to destroy them, and many may be dealt with by the same means. It is important to realise that an insect may be found in four different states or conditions, namely, as an egg, a grub or caterpillar, a chrysalis, and as a perfect insect capable of propagating its species. It is true that some insects are never grubs or caterpillars, or become chrysalides, for at similar periods of their life-history they more or less resemble their parents; still the change from one state to another is well marked, and the four different conditions are assumed (of course, there is no rule without an exception). It is important to bear this in mind, for sometimes, though an insect is quite harmless in one state, it is very destructive in another, and it may be that it is easier to destroy it in its harmless condition than in the one in which it is injurious. Insects, as far as their powers of injuring plants are concerned, may be roughly divided into two classes: those that injure the plants underground, and those that attack the parts of the plant which are above the surface of the soil. The former are, on the whole, perhaps the most injurious, for they attack a plant at a very vital part, namely, the root, and for obvious reasons the first intimation of their presence is given by the plant beginning to flag or droop, or show some signs of distress, so that the plant has already sustained considerable injury before we know that it is attacked; then when we realise that a certain plant is infested at its roots by some pest we cannot in most cases destroy it by means of an insecticide, as a large quantity would have to be used, and of more than ordinary strength (for the soil acts as a filter to a great extent), which would be very hurtful to the plant already weakened by the injuries to its roots. So that, in the case of plants grown in the flower garden, probably the best thing to do is to bury baits near the plants

to attract the pests, or to take up the plants and carefully pick out the insects from the roots, and destroy those that are in the soil. Nearly all the insects that feed on the roots of plants are in the grub or caterpillar state. There are a few exceptions, one or two species of aphides feeding on the roots of plants. It is often stated that ants injure the roots of plants. In one sense this is quite true, as they make their nests among them at times, but not with any intent of feeding on them, or injuring them in any way; but when they find a plant infested by one of these underground aphides, they make their nest so that they can easily obtain the sweet matter which these, like all other aphides, secrete, and the presence of the ants laying bare some of the roots, and the interference with their supply of moisture consequent on the nest surrounding them, is naturally very harmful to the plant. The ants in this respect are of a certain amount of use, as, when one of their nests is found at the roots of the plant, it is an almost sure sign that the latter are attacked by one of these aphides, which would seriously injure the plant if means were not taken to destroy them. Under these circumstances the plant should be lifted out of the ground, and its roots carefully washed so as to free them from the aphides, and the hole from which it was taken filled with boiling water so as to kill any of the pests which might be in the soil. This will also kill the ants if plenty of water be used so that it thoroughly fills the nest; boiling water is a most useful agent in killing all kinds of insects, it is absolutely sudden death to them. There are a great number of different kinds of

Grubs and Caterpillars that Feed on the Roots of Plants.—The former may be divided into two kinds, those with legs and those without. Those that have legs are the grubs of beetles, but they have only three pairs of legs, which are placed near the head; the caterpillars that may be found at the roots of plants have eight pairs, so they may easily be distinguished from grubs. Among the grubs of beetles, perhaps the best known are the

Wireworms, whose parents are the long, narrow, dull-coloured insects, belonging to the family Elateridæ, and commonly known as "skip-jack" or "click" beetles, which live among grass and weeds, and may often be seen on the flowers of "cow parsley" and other plants of that nature. These grubs have received the name of wireworms, on account of their resemblance to a short piece of copper wire; they vary in size according to the species, but the largest is seldom more than ¾-inch long; they are of a yellowish colour, except the heads, which are dark brown, and the three pairs of legs, which are just behind the head, are of the same colour. If these characteristics are borne in mind, it is impossible to mistake any other insect for a wireworm. These pests may be trapped by burying small slices of turnips, mangolds, carrots, or potatoes in the ground just below the surface; if a small wooden skewer be thrust into each they will be more easily handled, and their position in the soil more easily seen. Small pieces of oilcake are also very useful as traps, even if only placed on the ground. These traps should be examined every morning. When ground is being dug that is infested with this insect, a sharp look-out should be kept for them; though small, their colour soon betrays their presence. The grubs of the "common cockchafer" (*Melolontha vulgaris*) are also very injurious to the roots of various plants, and as they are three years old before they attain their full size, each grub has the opportunity of doing an immense amount of damage. The grubs, when full-grown, are about 2 inches long and almost ½ inch in diameter. They are nearly white, but their tails, which are generally curled under their bodies and are the thickest part of the grub, are bluish. Practically there is no way of destroying them except turning them up out of the ground, and the easiest way of keeping this insect in check is by killing the cockchafers. The grubs of several kinds of weevils feed on the roots of plants, but unfortunately they cannot be caught in traps as the wireworms can, and the best way when a plant is attacked is to take it up and pick out the grubs from among the roots. The caterpillars of the "ghost" and "swift moths" (*Hepialus humuli* and

H. lupulinus) attack the roots of various plants, and those of the "dart moth" (*Agro ti segetum*), and some others, on the roots and also on the collars of the plants. They hide under stones, clods, &c., or in cracks of the ground during the day. The other division,

Grubs with no Legs, are all the grubs of flies. Many only feed on decaying vegetable matter, but a large number feed on the roots of various plants. Those of the common daddy-long-legs (*Tipula oleracea*), often known as "Leather Jacket," are particularly injurious. When full grown they are about 1¼ inch in length, and as thick as a small quill. They are of a dull slaty brown colour, and though without legs are able to move about with considerable rapidity. They may be caught by the same kind of traps as the wireworms (but oilcake is of no use in their case), and also by laying pieces of board, slates, tiles, bricks, or pieces of turf on the ground, as they will creep under such things for shelter during the day. The traps should be examined every morning. The grubs of the cabbage-fly attack the roots of Cabbages and other plants of that nature. They are small grubs and are not more than one-third of an inch in length. They cannot be trapped. The plants that are attacked should be taken up with a spud so as to take away the soil just round the roots, and burnt. The holes made by their removal should be filled with lime or soot so as to kill any grubs that may be left in the soil. Plants that are only slightly injured may sometimes be saved by watering them two or three times with one part of ammoniacal liquor from the gasworks to two of water. Onions and Carrots are also attacked by the grubs of flies (*Anthomyia ceparum* and *Psila rosæ*). The best method of destroying these pests is by pulling up and burning the infested roots. To turn now to the

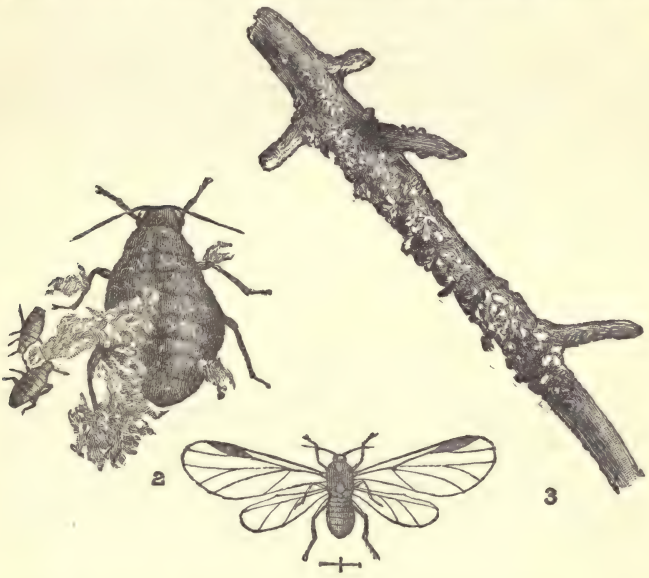
Insects that Attack Plants Above Ground.—Probably the different kinds of aphides or plant lice, of which the common green-fly perhaps is the best known species, are the most troublesome, for they infest so many different kinds of plants and increase and multiply at times with such remarkable rapidity that it seems almost impossible to keep them in check. There are a large number of species, but they all injure plants in the same way, by drawing off the juices through their long probosces, and by covering the leaves with a sweet sticky secretion commonly known as honey dew, which drops on and clogs the pores of the leaves, &c., that may be beneath them. One of the chief things to be remembered in their destruction is to take some steps in that way as soon as any are noticed, and not to think that a few cannot do much harm and so let them be. In suitable weather they will increase, so that in a few days the plant will be smothered with them. The best remedies for plants grown in the open air are spraying with paraffin emulsion or quassia extract (see Insecticides), or some other insecticide containing soft soap, such as "Paranaph" or "Abol," dusting the plants with powdered tobacco, or snuff, or in some cases dipping the end of the shoots into tobacco water or some other liquid insecticide. Under glass plants should be fumigated with tobacco smoke, or strong tobacco water should be vaporised over a small stove.

"**American Blight**" (*Schizoneura lanigera*), if only existing in small patches on a tree, may be killed by dipping a camel's-hair brush in methylated spirit and thoroughly wetting them with it; but if the attack is extensive the infested parts should be well scrubbed with a stiff brush and one of the soapy solutions just mentioned and the mixture thoroughly worked into all the cracks, &c., in the bark. Or the tree should be sprayed with a caustic wash in the course of the winter (see Insecticides). The caterpillars of butterflies and moths and the grubs of certain saw-flies that injure plants in the same manner are best picked off by hand unless they are in such numbers that it is worth while to syringe the plant with some insecticide. The grubs of the Currant saw-fly (*Nematus ribesii*) and the Pear saw-fly (*Eriocampa adumbrata*), when full grown, drop to the ground and become chrysalides in the soil, about 3 inches below the surface. If the ground below the trees to that depth is removed and burnt, or buried not less than a foot deep, the insects will be destroyed. When leaves are rolled up by caterpillars, as rose leaves often are, a close made basket or a box should be held under them while they are cut off, or the leaves may be pinched so as to kill the occupant, if care be taken that it does not drop out before the finger and thumb meet, as is often the case.

Certain small—

Caterpillars and Grubs live inside the leaves between the skins, such as the grub of the Marguerite daisy fly (*Phytomyza affinis*), which infest the leaves of that plant and others of a similar nature, and those of Cinerarias. The grubs of the Celery fly (*Tephritis onopordinis*), the Carnation fly (*Hylemyia nigrescens*), and Holly fly (*Phytomyza aquifolia*), all live within the leaves of the plant that they are named after. The only way of destroying them is to pinch the leaf at the part where the grub is, or to pierce the leaf with a pin or needle so as to stab the grub. If a leaf is very badly attacked, it should be cut off and burnt. The leaves of Lilacs and Laburnums are sometimes very much injured by the caterpillars of small moths (*Gracillaria syringella* and *Cemiostoma laburniella*) that feed inside the leaves. The caterpillars of the goat moth (*Cossus ligniperda*) and the wood leopard moth (*Zeuzera æsculi*) sometimes attack our fruit trees, and cause

much injury to them by boring long galleries in their stems. They are best destroyed by pushing a sharp-pointed wire into the hole until the insect is reached, or by injecting paraffin oil or tobacco water into the gallery by means of a small syringe with a fine nozzle, and immediately closing the hole with a plug of well-kneaded clay; or a piece of tow soaked in tar or paraffin oil may be pushed as far as possible into the tunnel, and the opening closed with clay so as to keep the smell in as much as possible. Currant bushes are sometimes attacked by the caterpillars of the Currant clear-wing moth (*Sesia tipuliformis*), which bore into the branches and shoots of Currant bushes, causing the death of the branch. The best way to deal with this insect is to cut off the shoot below where the caterpillar is and burn it, as the branch would die in any case. Among the insects that are injurious in their perfect state perhaps the various kinds of weevils are the most troublesome. The Pea and Bean weevils (*Sitones lineatus*) are often very destructive to our Pea and Bean crops; they injure the young plants by eating the leaves, gnawing large notches in them. They are difficult pests to deal with, for they only feed



AMERICAN BLIGHT IN VARIOUS STAGES. —|— SIGNIFIES NATURAL SIZE

1. The fly. 2. The insect. 3. Showing its effect upon a fruit tree shoot.

at night, and are so much the colour of the soil that it is almost impossible to find them when they drop off the plants, which they do at the least alarm. Dusting the leaves when they are wet with powdered lime, or soot, or gas-lime and soot mixed together, or spraying with paraffin emulsion is useful in preventing the weevils from attacking the leaves. Sand soaked in paraffin oil strewed on each side of the rows is also useful; the young plants should be pushed into rapid growth as quickly as possible. The well-known grubs in Nuts are the progeny of the Nut weevil (*Balaninus nucum*); the Black Vine weevil (*Otiorhyncus sulcatus*), and its brother, the clay-coloured weevil (*O. picipes*), are both very injurious to the foliage of plants in greenhouses, particularly to Vines, Peaches, Roses, Ferns, and many plants grown for their foliage, and their grubs feed on the roots of these plants. Out of doors they injure Raspberry bushes by feeding on the leaves, and by eating right through the young shoots. These beetles only feed at night, and, like the Pea weevils, fall to the ground on being in any way disturbed; they may be caught in houses by laying white sheets under the plants before it is dark, and afterwards throwing a bright light on them and shaking or tapping them. Out of doors an open

umbrella, or a piece of board freshly tarred or painted, so as to be sticky, should be held so that the weevils can be shaken on to them. The Black Vine weevil is about ⅜ inch in length, and is of a dark brown colour or black colour; the other species is somewhat smaller, and is of a pale brown colour. The Apple blossom weevil (*Anthonomus pomorum*) is a much smaller species; it lays its eggs in the opening flower-buds of the Apple, which soon hatch, and the grubs feed on the flowers, at times completely ruining the crop. When the weevils are seen on the trees they may be shaken down on to cloths or something sticky. Thrips (*Thrips adonidum*, and other species) is an insect that is very annoying in greenhouses, where it may be killed by the same means as recommended in the case of green-fly or aphides. Out of doors it seldom does much harm, but Carnations, Dahlias, Phloxes, and some other plants, are at times injured by them. To consider now some—

Garden Pests that are not really Insects. The mites stand first, among them the red-spider (*Tetranychus tellarius*) is the best known. As a rule, the plants that suffer most from them are too dry at the root; and in greenhouses the want of proper ventilation is generally the cause. The red-spider delights in warmth, dryness, and a still atmosphere. When a plant is infested by them it should be syringed with paraffin emulsion: to every 5 gallons add 1 oz. of sulphide of potassium; or, with ½ lb. of flowers of sulphur, 1 lb. of fresh lime, boiled in 2 gallons of water, then add ¾ lb. of soft soap, and when all is well mixed 2 gallons more water. Another very injurious mite is the Currant mite (*Phytoptus ribis*), which infests the buds of Black Currants, causing them to swell, but not to open properly, so that when many of the buds on a shoot are attacked it is rendered useless to the plant. The best remedy is to pick off these buds early in the spring, or cut off the entire shoot and burn them. Another mite, the bulb mite (*Rhizoglyphus echinopus*), is the cause of much injury to bulbs at times. They may usually be found at the base of the bulbs between the scales, or among the roots where they join the bulb. Various methods have been suggested for destroying them, but none of them are very satisfactory, perhaps soaking them in water at a temperature of 120 degrees or 125 degrees Fahr. for fifteen or twenty minutes will kill them; for, if placed in water at 115 degrees Fahr. (away from the bulb), they will die within five minutes. The snake millipedes (*Julidæ*) are often mistaken for insects, but there should be no difficulty in recognising them, as instead of having only three pairs of legs they have a very large number. These creatures are very injurious to the roots of plants, and are difficult to destroy with any insecticide, as they are tough and horny. A strong solution of salt or nitrate of soda will kill them if it can be made to reach them. They may be trapped by means of slates, tiles, &c., laid about; they move very slowly, and so may be easily distinguished from the centipedes (*Lithobius forficatus*), which they somewhat resemble. These are very useful in gardens, and run with great rapidity. Woodlice, or slaters (*Onisidæ*), as they are sometimes called, are often very troublesome pests, and do much mischief in greenhouses, Melon-pits, Mushroom-beds, and among Peaches and Strawberries. It is no use trying to kill them with insecticides, but when they are found, as is often the case, in regular colonies at the base of a wall just below the surface of the soil, they may be killed wholesale by pouring boiling water over them; they may also be trapped under slates, bricks, &c., and in small bundles of dry moss. Toads are very useful in keeping woodlice under, and many other night-feeding insect pests.

"Prevention is always said to be better than cure," and this is very true in the case of plants likely to be injured by insects, and fungi, weeds, stones, rubbish, &c., which harbour these pests, should never be allowed in gardens, even in out-of-the-way corners, and any prunings of trees or refuse of a crop that has been infested by any pest should be burned at once. Indeed, the old time-honoured rubbish heap should be turned into a bonfire far oftener than it is, for even when its contents are well rotted they are not of much value, and when spread over the ground often carry pests with them, and the ashes from a bonfire that has not been allowed to burn too rapidly are of considerable value. When garden ground is being dug a sharp look out should be kept for any chrysalides that may be turned up, particularly if the last crop was attacked by caterpillars.

Leaf-Curl in Peaches and Nectarines.—Beginners are generally puzzled about this characteristic of the Peach and Nectarine. The injury it causes is generally attributed to cold winds or draughts of some sort. No doubt certain conditions of the weather are more favourable to the growth of this fungus than others, a sudden fall in the temperature after mild weather, during which the leaves have opened, being particularly liable to cause an attack. Still, if this fungus was not present in the tissues of the tree, no atmospheric conditions would cause the disease. Peach leaves are often attacked by aphides, which cause the leaves to curl more or less, and the two kinds of attack are sometimes mistaken for the same, but the difference as a rule is easily detected. The "curl" is rather of a different nature; it has not the same puckered appearance, and though in both cases the diseased part of the leaf may turn red at last if caused by aphides, it never assumes the pale sickly green colour that it does from being infested by the fungus, nor

has it the almost velvety appearance. It happens not unfrequently that a tree may be infested by both pests, for insects often seem to prefer plants that are not in very robust health to those that are. The leaf-curl fungus attacks Peaches, Nectarines, and Almonds. How it gains access to the tissues of its host is not at present very certain, but it probably does so through the leaves. Having once established itself in a tree, there is no means of eradicating it except by cutting off the parts infested by it. The fungus lives throughout the year in the shoots and smaller branches, pushing its growth into the young leaves as they are opening, which causes a very abnormal growth of their tissues. The cells in the parts of the leaves between the veins growing much more rapidly than the veins, causes the leaves to become crumpled. These portions of the leaves are also much thicker than the other, and eventually the diseased parts become covered with a delicate bloom, the result of the spore-bearing part of the fungus being pushed through the surface of the leaf so that the spores can escape. The little spore-bearing cases are technically known as "asci," and cover the surface of the diseased part of the leaf. Each ascus or case contains at first only eight spores, but these increase by budding until the case is full. When ripe the spores are liberated and are carried about by the air, infecting any leaves they may meet with.

As to the best way of dealing with this pest, probably the most useful is to cut off any shoot that bears infected leaves as far back as possible, so as, if possible, to remove all the infected wood and burn it. Any leaves which are diseased that may have fallen should be gathered up and burnt. Spraying with Bordeaux mixture as the leaves are opening, and again in about three weeks' time, is useful in destroying any spores that may be carried from other trees. There is no method by which the fungus while in the shoots of the tree can be destroyed, so that when once a tree is infected, unless the diseased portions can be cut off, the fungus is almost sure in time to kill the tree. A certain amount of shelter to the trees in inclement weather as the leaves are opening, so as to prevent any checking of their growth taking place, is most useful, and should always be provided if possible. Though such precautions may appear to prevent an attack, it should always be borne in mind that they do not kill the pest, but merely prevent it from growing into the leaves and bearing fruit, just as some plants will not flower in seasons that are not congenial to them, for the pest remains in the shoot or shoots all the same. The number of

INSECTICIDES

is so great that it is impossible to even enumerate all of them, but many if not most of them are quite useless, so a few have been selected whose value is generally recognised. It should always be remembered that one application is seldom sufficient, for as a rule the eggs, if there are any, are not killed, so the process should be repeated in the course of five or six days, and care should be taken that the undersides of the leaves are properly wetted when they are infested by red spider, thrips, and other pests that live in that position. Most insecticides are best applied by a spraying machine or a syringe with a spraying nozzle. These are made so that the under sides of the leaves are easily reached, and much less of the insecticide is needed than if an ordinary syringe is used. Soft soap forms one of the ingredients in most of the mixtures. The reason of this is that the soap helps the fluid to adhere to the insects and it also chokes up their breathing pores. (Insects do not breathe through their mouths but through certain pores which are usually placed on either side of their bodies.) Insecticides should not be used when the sun is shining on the plants or in very bright weather. Apply them in the evening and wash the plant clean the next morning. Plants with very tender shoots and foliage are more likely to be injured than others, and in their case the washes should be more diluted.

Paraffin Emulsion, composed as it is of two ingredients, both very fatal to insects, is one of the best. It should be made by dissolving one quart of soft soap in two quarts of boiling water, and stirring in while the mixture is quite hot one pint of paraffin oil. To make the combination of the oil and soap more complete it should be worked through a syringe for some five or ten minutes until a creamy mixture is formed. If this has been properly done the oil and the soap will not separate. If they do the oil floats on the top, and it is difficult to insure that some part of the plant does not get a stronger dose of it than it should and so be injured. To every pint of this emulsion add ten pints of water before using it.

Mr. H. H. Cousins, of the Agricultural College, Wye, recommends a mixture very similar to the above, but with a certain amount of naphthaline added to it. Directions for making it can be obtained from him; or it can be bought under the name of "Paranaph."

Tobacco Water.—Boil 1 oz. of strong tobacco in a gallon of water, add 2 oz. of soft soap, strain and use when cold. It should then be of the colour of fairly strong tea.

Quassia and Soft Soap Wash.—Soak ½ lb. of quassia chips in a gallon of cold water for some hours, then boil gently for an hour or more; strain out the chips, add 5 oz. of soft soap, and, before using, 4 gallons of water. It should not be allowed to touch fruit.

Caustic Alkali Wash.—This mixture is very useful as a winter wash for fruit trees that are infested with American blight, scale, &c. It destroys all insect life with which it comes in contact, also all moss and lichens. It is quite harmless to the trees so long as it is used before the buds begin to open. It is very caustic, and should not be allowed to get on the skin if possible. It will also spoil clothes, so that it should be used on a still day to prevent it being blown on to the operator when using it. Make it as follows:—Dissolve 1 lb. of ground caustic soda in a gallon of water, add ¾ lb. of pearl ash, stir until all is dissolved, and then add 9 gallons of water, and lastly 10 oz. of soft soap which has been dissolved in a little boiling water; mix thoroughly, and the solution is ready for use.

Paris Green.—This insecticide should always be used with care as it is very poisonous, but it is very useful in killing caterpillars that are injuring the foliage of fruit trees and plants. It is generally sold in a powder, but it is better to buy it as a paste, as it does not then blow about. One oz. should be used with every 12 gallons of water and twice the amount of the Paris green (bulk for bulk) must be added or the foliage will be injured. The mixture must be kept well stirred as the Paris green is very heavy and soon sinks to the bottom. It should be used as a spray, and only enough should be used to wet the leaves and not to make them drip. Paris green should not be used when trees and plants are in flower, or within a month of the fruit becoming ripe.

In making up these recipes soft water should be used if possible. If hard water must be used add a little soda.

Gas Lime if applied at the rate of ½ lb. to 1 lb. per square yard will kill wireworms and other insects that are infesting the soil, also snake millipedes, but no crop can be grown on the ground for nine months after the application.

Nitrate of Soda is useful when applied as a strong solution in water to the roots of plants. It is very distasteful to insects, &c., and is a stimulant to the plants.

Soot when fresh is useful if laid thickly round the plants, and then worked in, for keeping grubs, &c., away from the roots.

Though it is impossible now to deal with the fungi which attack plants, it should be always borne in mind that if a plant is infested any leaves that fall from it should be collected and burnt, and the plants themselves, if only annuals, should be treated in the same way as soon as there is no further use for them. If only thrown on a rubbish heap or allowed to remain on the ground for some time an opportunity may be given for the winter form of spores to ripen and reproduce its species the next season. The

Best Fungicide for general use is Bordeaux mixture. To make it dissolve 10 oz. of sulphate of copper in a little boiling water, and add 5 gallons of cold water, slake 6 oz. of lime in water, and pour it into the copper solution when cold; stir the mixture well so as to be sure that all is of uniform strength; then dip the blade of a bright knife into the mixture for a minute; if the colour of the steel is unchanged it is all right, but if the blade has a coppery appearance more lime should be added or the mixture will injure the foliage. Another test is to place some of the mixture into a plate, hold it up and blow gently upon it for quite half a minute, when, if a slight scum like a little oil appears on the surface, it is as it should be.

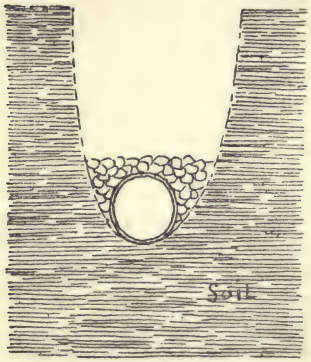
SNOWDROPS AMONG BUSHES.

SOILS AND THEIR TREATMENT AND MANURES

It is by no means essential that a gardener should possess scientific or chemical knowledge of the constituents or composition of the soil of his garden. Many good cultivators never have possessed such knowledge, yet have obtained splendid crops. It is not our purpose in this chapter on soils to enter into any scientific disquisition on their composition, as it is outside the scope of a beginner's book. Would-be cultivators of the soil—in other words, gardeners—soon find that, whilst scientific knowledge of soil composts may be of some value to them, greater value is derived from sound information relating to culture and cropping, and this it is our intention to furnish.

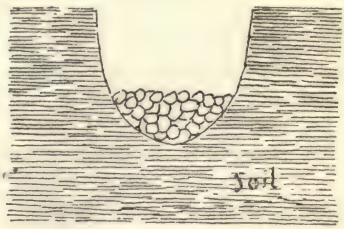
Soils are of very light, porous, sandy material, of a combination of stone-brash or gravel with loam—which is, by-the-bye, a term applied to soils that have clay and sand in about equal proportions; of chalk, which is abundant in various localities, and if for a time thin and poor becomes eventually, with good culture, very fertile; and finally clay, a description of soil in which sand is materially absent, is very close, almost impervious to moisture or air, and, if retentive of moisture when wetted, yet has the reverse demerit of baking intensely hard and becoming difficult to work or crop in hot dry seasons. Whatever description of soil it may be the cultivator's lot to till, it is obvious that his aim must be to endeavour to associate retentive matter in the form of clay with soils that are very light, sandy, gravelly, or porous, and that quickly part with moisture and become unduly dry under the influence of sun or wind. The application of sand or of any light porous mineral or vegetable matter to clay soils tends to the same ends. But every gardener finds that in time deep culture, such as trenching ground presents, allied to the introduction of vegetable or animal matter in a state of semi-decay, does great good to all descriptions of soils. Deep culture is often effective as drainage, allowing surplus moisture to escape and enabling the air to permeate the soil, purifying and sweetening it and causing it to become fertile.

It cannot be too clearly understood, that soil which is at all waterlogged or retains water unduly never can be sweet or fertile. It may produce coarse weeds freely, but never good garden crops. Wherever water is retained air is excluded, and mineral or other plant foods or crop manures are washed away and destroyed. Thus whilst the majority of soils may need no special drainage, porous pipe drains, laid in from two feet to three feet deep into the ground at from twenty-five feet to thirty feet apart, leading to some ditch or stream for outfall, serve a valuable purpose. When these pipe drains are laid down in narrow excavations, some woody material—heather, furse, or hedge trimmings—should be laid over them before the soil is filled in. This will prevent the drains from becoming clogged. Where pipes are not used, rough rubble of any description will suffice if some six inches to eight inches thick. Still this is work that is needed only when water gives much trouble in gardens. When soil suffers only from exceptional floodings through being near to streams or from very heavy storms, it is well to keep open, on the surface, drains twelve inches wide and ten inches deep, as these greatly facilitate the removal of the water. But all experience goes to prove that



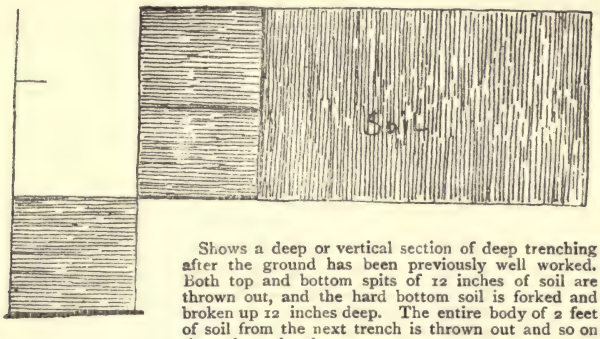
DEEP OR PIPE DRAIN

Trenching ground from twenty inches to thirty inches deep, according to conditions, is productive of immense good, even in relation to drainage. It frequently happens that just beneath the top twelve inches of soil there is a hard pan of some almost impervious material, which has never been broken up. This, if of stone or rock, is best removed absolutely, but if it be of any softer material, such as can be broken well, it is best in the process of trenching to break it up thoroughly, some ten inches to twelve inches deep, and leave it lying where found before the upper porous soil is replaced. Such impervious subsoils as thus described in time become loose, porous, and fertile. Air sweetens and



SHALLOW RUBBLE DRAIN

crumbles them. Applications of manure render them capable of supplying plant food. They serve also to assist crops in dry weather in finding root room and moisture; they enable heavy surface rains to pass away freely; and as air always follows the retreating moisture, these once useless, worthless subsoils in time become of the most valuable description. There seems to be absolutely no description of subsoil that cannot be made in this way fertile. A most important product of deep working or trenching ground is that, not only does it tend in winter to keep the soil in which crops may be growing drier than shallow soils do, but is also much warmer. In the summer, when drought so commonly prevails, their good working enables the roots of crops to go so much deeper, where the soil is at once cooler and moister,



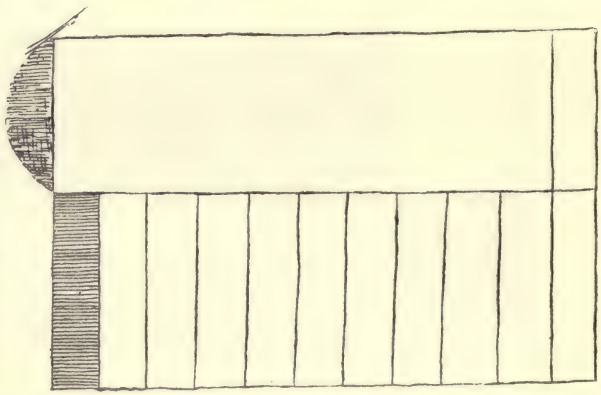
Shows a deep or vertical section of deep trenching after the ground has been previously well worked. Both top and bottom spits of 12 inches of soil are thrown out, and the hard bottom soil is forked and broken up 12 inches deep. The entire body of 2 feet of soil from the next trench is thrown out and so on throughout the plot.

and thus continues productive much longer. Remarkable illustrations of the differences found in crops grown on deeply-worked and shallow-dry soils are often seen on groups of allotments, where the soil is quite of the same nature or texture. In the first case the crops are robust and luxuriant; in the latter they are poor, soon ceasing to be productive.

Operations.—The process of trenching is simple enough, but should be invariably performed during the winter months, on plots that are for the time uncropped, and have not been deeply worked previously or for several years. In good class gardens the work is done about every third year, but if done in gardens where labour is less abundant it is carried out once in from four to five years. The first effort of the cultivator in trenching where soils have not been so previously treated, is to do so in such a way that the lower or subsoil be not brought to the surface. This is described as

half or bastard trenching. Were the lower sour soils brought to the surface at once crops would fail or growth be very poor in consequence. For that reason the cultivator not only leaves these subsoils where found for some time, but as they become sweet and fertile gradually mixes or incorporates them with the upper good soil, so that in time the entire worked depth is sweet and productive. After several years of such treatment trenching may take a complete form, the lower soil being brought to the surface and the top soil buried low down, but being in its turn brought up again some three years later.

In Half Trenching a plot of ground, if broad, the operator must start by dividing it into two equal portions, running a mark down the centre to form a division, then throwing out at one end of one of the halves the whole of the top soil



A surface example of how to trench a plot of ground. Open a trench 2 feet wide at the left-hand end of one-half. Then trench the whole strip, as marked, returning on the other half. Finish where soil from the first trench has been placed for the purpose of filling.

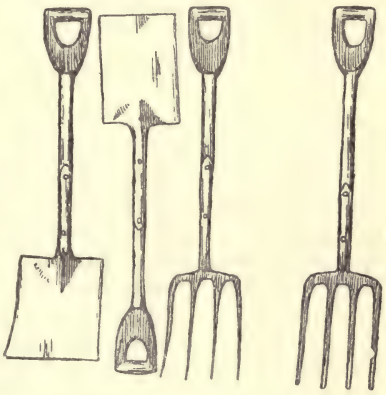
down to a depth of twelve inches and a width of twenty-four inches on to the adjoining soil. With a strong fork thoroughly break up the bottom soil fully twelve inches deep, and leave it there. It is an admirable plan when manure is at hand to cast in on to this broken bottom a liberal dressing and refork that into the soil. Then from the next width of two feet throw on to the first trench the whole top soil, twelve inches deep, and the first trench is filled and complete. Keep on repeating this trenching process until the entire half of the plot is done. Then open a trench of the same width and depth at that end of the other half, using the soil taken out to fill up the end trench of the first half, and that portion is completed. Then the process has to be repeated with the second half until that also is done.

Trenching is laborious work, but always pays well for its

performance, therefore great care should always be taken that the whole of the soil be worked deep and equally. If the surface soil after trenching needs a manure dressing get it on with a barrow, putting down planks on which to wheel. Then spread the manure and well fork it in, and the plot will then be in first-rate condition for cropping in the spring. In

Complete trenching it is needful to throw out from the first trench the entire depth of two feet of soil and of that width. The bottom should then be deeply forked up and the whole of the soil from the next trench of same width and depth cast into it. That process naturally brings the lower soil to the surface, but it may be practised with the best results when the whole body of soil has become thoroughly sweetened.

Digging ground, whether with spade or fork, is a simpler process, and is practised on all plots of soil not trenched and between each kind of crop. Light steel spades or forks enable this work to be done without rendering the labour exhausting. But to move the soil as deep as possible, say twelve inches, the tool blade or tines should be new and long. Digging necessitates opening at one end of a piece of ground a trench twelve inches wide and deep, and casting it out ready to fill the trench left when the second half of the plot is done. If the plot be so divided as suggested for trenching, or if the piece of ground be dug from one end to the other, then the whole of the soil from the trench must be wheeled in a barrow to the end, where the digging is concluded for filling the trench. The tools should be kept upright, and with the foot sent down into the soil to their full length so that the movement of the ground may be as deep as possible. In digging, also, the soil should be kept quite even and level, as that shows good work.



From right hand side :—1. Broad-tined steel digging fork. 2. Narrow-tined steel fork. 3. Spade. 4. Shovel. The broad-tined fork is the best for digging, the narrow-tined fork is more useful for moving manure, &c.

Forking is moving the soil a few inches in depth as amidst growing crops, where it has become too hard or is weedy, or the weeds need burying, or amongst flower beds or borders. This work, if done with care, so that crop roots

be not disturbed, does much good as well as renders the soil porous, loose, and neat.

Hoeing produces similar results, and is admirable spring and summer work. It is chiefly performed to destroy summer weeds, but in every case as soon as seeds, crops, or plants generally have made visible growth the hoe should be freely used about and amongst them, as it is of great importance to keep a loose, light, and, of course, clean surface of soil, as in such case the soil beneath dries far less rapidly than is the case when left unhoed. Hoeing is most valuable summer soil culture, and should be constantly performed.

Manuring.—This term simply means that plants, like animals, have to be fed. But whilst animals partake of food through their mouths, plants do so through their roots. The soil is their dining-room, and it is a good one when it contains plenty of plant food. All plants have more or less similar methods of taking up food. They have on their roots, and generally on their smaller or fibrous roots, minute hairs, and these have throats or hollow trunks through which they absorb in liquid form all the foods or manures put into the soil for plants to exist on. We know, too, by experience and observation, how beneficial manure is to crops. Who walking over a meadow has not noticed that where animal excrement has fallen there the grass becomes strong and vigorous. The same may be seen in a field of corn, or where manure shot down from a cart has remained a few weeks before being spread, as that particular spot always produces the strongest corn. In the garden we have found, by adding to the soil manure from stables, cow-sheds, pig-styes, or fowl-houses, or any decayed vegetable matter, such as leaves, or of soot or salt, that vegetation is always more robust than where no such dressing is given. Observation has shown that to have good crops we must supply plants with manures, or, to use the proper term, plant foods. Then all these manures, no matter whether they be of animal, or vegetable such as rotten leaves, or mineral such as guano, nitrate of soda, kainit, salt, &c., must be easy to dissolve when brought into contact with the moisture of the air and earth. Thus there are what are termed soluble manures—that is, those which soon or in a few months become dissolved. Insoluble manures are such as bones in an unbroken state, yet bones broken up fine or steamed soft become first-rate plant food.

Plants cannot eat or use the soil as food, as that is purely mineral and insoluble, but they do live on the soluble elements found in soils, and as a rule, especially in gardens, these must be put there by the gardener. Scientifically we know that

all plants are formed, more or less according to their nature, of three primary elements—phosphate, potash, and nitrogen, with a few others. And these things in manuring we seek to supply to the soil in some form or another: thus all vegetable matter when changed into manure, through animal consumption or when in a state of decay, gives back to the soil what originally came from it; also all leafage abstracts from the air certain gases which are utilised by the plant, and become plant food also. So that, were a crop of something green dug into the ground as a manure dressing, it always gives back to the soil in that way more than came from it. Thus green crops of Tares, Peas, Barley, Oats, or similar green plants, dug in, always greatly fertilise the soil. Primarily our manure supply is found in what animals furnish with the aid too of straw or moss-litter. As this is collected from stables, cowsheds, &c., it should be put into a neat heap, and be turned twice at intervals of two weeks before putting it on the soil. When applied quite fresh it is apt to be too crude, and when allowed to remain about and ferment, or be washed by rain, runs to waste. Care in this matter is always well repaid.

Animal Manures may be applied to soil at any convenient time, but should always be in a half-decayed moist condition. Dry straw manures are of little good, as plants find nothing to utilise in them. Generally the best time to dress land is in the autumn and winter and on wet soil. It is a good plan to take advantage of hard frost for wheeling manure over paths and soil. As to quantity of such manure a couple of wheelbarrow loads commonly suffice for a rod of ground. Still, much depends on the nature of the manure and soil.

Artificial, or Chemical Manures, so called, being chiefly of a dry or powdery form and having their food properties highly concentrated, are, relative to animal manures, much more costly. But if good, that is, contain a high percentage of the elements previously mentioned, they are not expensive, because used in comparatively small quantities. Thus, if two barrowfuls of animal manure are needful for a rod of ground, a dressing of about six lbs. of any good chemical manure is ample for the same area. Chemical manures comprise phosphate, made from softened bones, or the powder known as basic slag. This phosphate makes hard woody material in plants, just as it makes bone in animals. Then potash comes from kainit and other salts dug from the earth. That again helps to make tissue, fruits, and seeds. Nitrogen comes from nitrate of soda, or a salt found in the veins of the earth, sulphate of ammonia, obtained in the making of coal gas,

and from other things. This nitrogen specially creates leaves and soft stems. The best way to obtain these manures is to purchase each one in a raw state from the merchants, and mix them to form what is called a complete manure, in this proportion : Phosphate, 4 lbs. ; kainit, 2 lbs. ; and nitrate, 2 lbs. Generally the rule is to mix the two first only, and apply them when soil is dug or forked over in the winter, adding the nitrate after the crop has made some growth, and hoeing it in immediately. Lime may be applied at the rate of half a bushel per rod to wet, sour, or clogged soil, saving a manure dressing for the season. Soot may be beneficially applied to land or crops at almost any time.

Liquid Manures.—Plants can always utilise liquid manures the moment applied, because they are very quick acting. They are especially valuable for plants in pots or other restricted area, where food is limited. But they are all the same of the greatest benefit applied freely to trees, shrubs, roses, fruits, vegetables, and flowers of nearly every description. A pound of guano, soaked in six gallons of water, or a peck of good horse droppings, or fowls' manure, put into a bag, or half a peck of soot, all similarly treated, make good liquid manure. House sewage is good applied to coarse vegetables or trees. The drainings of farmyards, stables, &c., with three times the quantity of water added, make good liquid manure also. Still these liquids should not be applied too freely ; a watering once a week suffices for most growing plants.

In gardens it is an excellent plan to have a large tub that can be used for the making of liquid manure of any description standing in some out-of-the-way corner. When the liquid is used daily, though not to the same crop or plant, no unpleasant smell is emitted. When not in use an old sack or mat may be thrown over the tub.

FLOWER BORDERS THROUGH VEGETABLE GARDEN.

VEGETABLE GROWING

VEGETABLES should form no small part of the garden, and the cottager fills his plot chiefly with the things he knows will bring comfort to the family. This phase of gardening therefore has been dealt with fully, knowing that individual tastes differ greatly, one preferring the succulent Cabbage, another a more dainty vegetable, the Asparagus or the Seakale; and to meet the desires of all, the principal kinds are described, with accompanying cultural notes. Even the small vegetable plot may be made pretty with flowers, perhaps a border of white Pinks on each side of the path, or some flower as simple and fragrant.

Artichokes, Globe.—Plants of these can be raised from seed sown in a shallow pan or box stood in a frame early in May, or be sown in a shallow drill outdoors, being thinned out to 12 inches apart. Those raised under glass must be planted outdoors when strong enough. Only a few plants are needed in any garden. In November they should be lifted from where sown and be planted in deep soil, 4 feet apart, in a row, as growth is very strong. Their edible product is found in the green-pointed scales which form the flower-heads in a bud state. They must be cut whilst closed. Their value as food depends on the fleshiness of these scales. New growths break out early each winter, and these need some protection in winter by having straw wrapped round them. Plants can be increased by lifting some of these growths or suckers, with soil attached, and planting them out into fresh soil.

Artichokes, Tuberous.—There are two distinct forms of these roots, which are called Artichokes without any reason—the tall one, of the sunflower family, that produces large irregular-shaped roots and is of somewhat close watery texture, and the Chinese Artichoke so called, having quite small, white knotted roots, and is best known as *Stachys tuberifera*. The former is grown by planting medium-sized tubers in March in good but not necessarily rich soil, in rows 2 feet apart, the sets being buried 6 inches. A small plot usually suffices for all ordinary purposes, as the tubers are chiefly used in the making of soups or stews. The stems are single, and grow to a great height, often to 6 feet. A row or two, therefore, makes a useful break for unsightly objects in the summer. The plants, however, very seldom produce flowers. The stems die down in November, when they may be removed, and roots, which frost does not harm when in the ground, may be lifted and used as needed. Some should be planted in fresh ground every year.

The *Chinese Artichoke* tubers should be planted in February in rows 20 inches apart, and 12 inches apart in the rows. These like deep, good ground. The tubers may be dibbled into a depth of 4 inches. Growth begins in April, and is bushy and dwarf, the leaves being much like those of Sage. During the summer the bed becomes densely covered with growth which dies down in the autumn. The roots, or tubers, may be forked out as wanted during the winter, being washed and cooked at once, partially boiled, then finished by frying them to brown the tubers, when they are delicious eating. A fresh bed should be planted every winter to keep up a supply of good tubers.

Asparagus.—Beginners may possibly be unable to cultivate Asparagus until they have had some experience of other vegetables. But Asparagus is a native plant, and is easily grown. It is propagated by sowing seed, for that is abundantly produced, and is cheap. For the reception of the seed the ground should be dug deeply, and well manured in the winter. If it runs together, then it should be lightly forked over early in April, but if it remains light and loose, drills may be drawn and seed sown

thinly along them about the middle of that month. Drills should be 14 inches apart, and about an inch deep. When growth is good, and the shoots are 4 inches in height, the seedling plants should be thinned out to 6 inches apart, the soil about them being kept well hoed and clean all the season. In the autumn the stems die down, leaving strong, fleshy roots, having a cluster of crowns in the centre. To make a permanent bed, trench during the winter a piece of ground of sufficient size quite 2 feet in depth, mixing into the bottom soil a good dressing of half-decayed manure. Do the same with the top spit of soil, so that, the sides being deep, the ground is well enriched with manure early in April. With the aid of a garden line, throw out trenches 4 inches deep and 7 inches wide, and 2½ feet apart. Into these put the best of the seedling Asparagus roots, lifted for the purpose, at 2 feet apart, and cover them up and level the soil. Growth the first year should be strong, and can be materially helped by strewing over and hoeing into the soil, after the stems are 12 inches in height, a light dressing of coarse salt or of nitrate of soda. Weeds must be kept down all summer. In the autumn the growths will again die down. During the winter a top dressing of manure may be laid along between the rows. The treatment the second year must be as for the first year, and the same in the winter. Then the following spring, or third season, some of the stems as they appear above the ground may be cut for eating up to the middle of June, and the following year cutting may go on till the end of that month, and the same for many years after. Dressings of salt or nitrate of soda may be given each summer, and of manure each winter, and so treated, a bed as advised, not raised, but kept level with the ground, will prove the most profitable, and give good Asparagus in abundance. But it is useless to put out plants without first preparing the ground.

Beans.—Of these pod-bearing vegetables there are three distinctive forms: Broad or Longpods, Climbers, and Dwarf Kidney. The first named are fairly hardy, the last mentioned are quite tender.

Beans, Broad.—These Beans may be sown as early in the year as January, other sowings being made in the two following months. Because the plants are very susceptible to attacks of a black insect called aphis, or dolphin, it is not advisable to make sowings later than the end of March in the south or the end of April in the north, except where the air is moist and the soil deep and holding. The plants make very erect growths, carrying two or three stems from each seed. In good ground they will reach to a height of 3 feet, but when some 15 inches of bloom is expanded on the stems it is wise to pinch out the top of the plants, as that checks growth, and causes the pods to form and lengthen. The usual rule is to sow in drills, 4 inches deep, drawn at 2 feet apart, the seed beans being placed 4 inches apart in the drills. Sometimes double drills are drawn 6 inches apart, the seeds being placed into each as already advised. In such cases the rows should be fully 2½ feet apart. As Broad Beans seldom find favour after Peas become plentiful, that again is another reason for not making more than about three early sowings, except where these Beans are specially desired.

The Broad form of Beans is known as Windsor, and there are ordinary brown-seeded and green-seeded, or Green Windsor. All the pods are very broad and rather short, seldom producing more than two Beans in each pod. Those who like large Beans when cooked, or if allowed to get rather old, then boiled and skinned before being served to table, think these Broad Beans best. The Longpod form includes several varieties, the best being Early Longpod, Johnson's Wonderful, the best Main Crop one, and the Seville Aquadulce, which is known under various names. This latter produces few, but very long pods on a plant. Sometimes the pods are 12 inches in length. But the two first named are much the most profitable. There is a very dwarf form known as Dwarf Fan Cluster or Green Gem, but this is seldom grown.

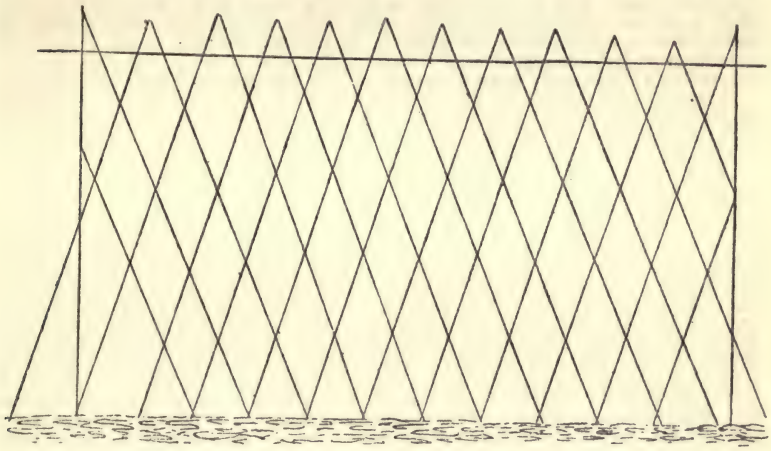
These hardy Beans do best on stiff holding, deeply-worked, well-manured soil. When the black-fly which so commonly infests these Beans appears, it is always on the young tops. These may be picked off carefully, and be carried away and scalded, as if thrown on the ground where gathered the insects soon return to the plants. When the soil is good and moist, not much trouble is given. A pint of seeds will plant some 60 to 70 feet run of rows. In no case should there be crowding in the hope of securing a fine crop. That would only result in failure.

Beans, Climbing.—These are all tender, and the seeds are of kidney shape, hence the common term Kidney Bean. Their season ranges from May till October, but cold soon injures them. Because they are of climbing habit, it is needful to furnish them with sticks either straight or branching, or string, or a similar support, to which they readily attach themselves, and then in good ground they will grow to a great height. The best form is found in the rough-podded Runner, commonly called the Scarlet or Dutch Runner. This has red-speckled and pure white seeds, the former producing scarlet flowers, the latter white ones. There is an old variety, Painted Lady, the flowers red and white. All have the same character in leaf, pod, and productiveness. The most favoured, however, are the Scarlet Runners. A capital feature in a good row of these Beans is that when well staked

a good blind or break in a garden is formed for some three months of the year, or they may be so planted and trained as to make an admirable creeper-covered arbour.

Culture.—Because tender, essentially summer croppers, and long-enduring, it is needful to give them good, deep holding, retentive soil. In all cases where possible the ground should be deeply trenched and heavily manured in the preceding winter. Where that is not practicable, there should be opened for each row a trench 20 inches wide and deep, the bottom then broken up with a fork, layers of soil and manure being added until the trench is filled. After settling down for a few days, the Beans should be sown in drills drawn with a hoe, 3 inches deep and 6 inches apart, down the centre of the trench, the seeds being placed in these drills at not less than 6 inches apart so as to give the plants ample room. The drills should then be carefully filled with fine soil. So far the culture is simple, so much depending on the preparation of the ground, thin sowing, and good seed. That can always be had good by careful saving from the previous season's stock, or purchasing from a good seedsman.

Manuring.—There is great need for liberal manuring of the ground for these pod-bearing crops. Abundant produce can only be had when growth is strong, indeed, almost luxuriant. To create that, plenty of good nitrogenous manure, such as animals give, is needful. Further, all these plants like occasional good soakings of liquid manure in



WAY TO ARRANGE RUNNER BEAN ROW

the form of house sewage, or slops, or the drainage of stables, cow-sheds, pig-styes, &c., in dry weather. Also they benefit by being syringed in the evenings with clear water in hot weather, such dampings especially helping flowers to set seeds rather than to fall prematurely from the plants. Artificial manures are best given in liquid form, after being soaked in a tub. Four pounds of any good artificial manure will make 40 gallons of liquid manure.

The time of sowing should not be too early, except where it is possible to give the plants good shelter. Thus a sowing may be made as early as the middle of April at the bottom of a warm sunny wall or wood-fence. This sowing should be made, however, only to secure a few early pickings, as it is too hot later on. Generally the first sowing may be made quite early in May, as then the plants are usually through the ground in two weeks. A second sowing, to give a good succession, may be made a month later.

Supports should be furnished before the plants begin to throw up tendril or climbing stems. In whatever form, they should be fixed about 3 inches from the plants along each side of the rows, and range from 5 to 7 feet in height. We have seen, where soil was deep and good and stakes tall, Runner Beans reach a height of 9 feet, cropping abundantly all the way up. Preference should be given to long rods, and each plant should have its own stake. These the climbing tops soon attach themselves to, or, if need be, can be helped to find their own proper supports.

Gathering the pods should not be neglected, as allowing many to remain on the

plants and become old greatly hinders production. If some be needed to produce seed, select and leave one of the longest and straightest here and there, but not more than will give the required quantity of seed. Of all others gather as fast as they attain the proper table size, having them rather young than old.

Varieties.—The best of the scarlet-flowered Runners are Ne Plus Ultra, Hill's Pride, and Best of All, quite long podded and very handsome; and of the whites, Giant Titan and Girtford Giant. There are other climbers having smooth pods, such as Tender and True or Climbing Canadian Wonder, the Caseknife, and the Mont d'Or or Golden Butter Beans, the pods of which are gathered when yellow and cooked whole, forming a novel and delicious dish. All these Runners need practically the same treatment.

Beans, Kidney Dwarf.—These are commonly known also as French Beans, but the term is not a correct one. The seeds of these are generally smaller than those of the large Scarlet Runner, and are very varied in colour, there being many varieties. They are essentially summer croppers, and have about the same season as the Runners have, but do not need such rich soil, as they are less productive or enduring. They do well in any good garden soil, in rows from 24 inches to 30 inches apart, according to strength or variety. Drills should be 3 inches deep and single, and the seeds set into them from 3 inches to 6 inches apart, as plenty of room is needful. The times of sowing may range from the middle of April on a warm border and every fortnight on to more open ground up to the end of July, and even in August on to a warm border again where protected from cold winds, or large wood frames can be placed over the plants to enable them to crop well into the autumn. In all cases the pods should be gathered so soon as fit for cooking, or otherwise the plants soon cease to crop. In very hot weather place a dressing of manure between the rows and give liberal supplies of water.

Varieties.—For outdoor culture one of the very best earlies is Ne Plus Ultra. That can be succeeded by Negro, and followed by Mohawk, Magnum Bonum, and Canadian Wonder. The latter two are rather strong growers. Out of the many varieties these are some of the best and most widely grown, but all are good.

Beets.—These are usually called Beetroots, but the term "roots" is needless. These useful products, all of a highly nutritious nature, and constituting most valuable food, are in two diverse forms. The earliest are round or turnip-rooted, the later ones are all long or taper-rooted. For early purposes the very best is the Blood-Red, a selection of great value from the original Egyptian round-rooted, and much superior. Its great usefulness lies in the quickness with which the bulbs are formed, and therefore early use in the summer and autumn before the long or tapering-rooted varieties are ready for pulling. Beets like a deep holding soil of good quality that has been rendered fine and loose by well turning it up with a fork in the spring. If a previous crop has been well manured, and the ground before the winter thrown up roughly, and later forked down level for sowing, it is better so to leave it than to add fresh manure, as such application in a fresh state tends to the production of side roots, which are, on all these products, very objectionable. But when it is essential to add manure to the ground it should be dug in, or better still, trenched in early in the preceding winter, burying it well down. All these tapering roots obtain their sap food chiefly through the aid of the fine point root which strikes vertically into the soil; hence where manure is low down it is more readily utilised.

Sowing the earliest crop may take place in the south quite early in April and in the north at the end of the month. A fairly sheltered position is best. The drills, which may be an inch in depth, should be 12 inches apart, the seed being sown thinly in them, then covered with fine soil, roughly raked over, and left neat on the surface. As the plants give somewhat sweet leafage birds are apt to prey upon it, hence some protection, either in the form of nets or dusting with lime or soot, may be needful for a few weeks after growth begins, to protect the plants from harm. To have these round-rooted early Beets in good condition the plants in the rows should be thinned to 6 inches apart, and throughout the summer the surface soil be freely stirred with a hoe both to kill weeds and to retain moisture. When the roots are but half grown they may be pulled for use; and when fully grown, which they will be by the beginning of August, they are of a dark crimson colour, flesh fine and firm, of good flavour, and delicious when cooked and eaten while cold, or sliced and eaten as salading. The blood-red, globe-shaped variety, with its tops of dark hue and moderate growth, should be asked for.

Beets, Tapering.—As these forms make good growth well into the autumn, early sowing is undesirable. It is therefore soon enough to make sowings during the month of May. The ground should be prepared as before mentioned, the drills being drawn 14 inches apart, and grow them as advised for the round-rooted forms. In using a hoe between the rows great care should be taken not to injure the roots. Large roots are undesirable, for these invariably have inferior and less well-coloured flesh than those of medium size.

Varieties.—Some that show handsome dark-hued leafage and also have roots of rich deep colour and good refined flesh are Dell's Crimson, Pragnell's Exhibition, Nutting's

Red, and Blood-Red; others having foliage of somewhat greener colour are Cheltenham Black and Sutton's Black. These, when moderately well grown, give roots of the highest excellence in flavour and deep-coloured flesh.

Wintering.—Being somewhat tender, it is needful to lift Beets from the ground and store them in dry sand or ashes in any cool shed or outhouse from which frosts are excluded. The cooler the roots can be kept the better. The lifting should be done not later than the middle of November, the soil being carefully rubbed from each root, and the leaves not cut but twisted off, before placing the roots in the sand. Store them so that the crowns project. An occasional looking over them is needful during the winter. Carefully preserved roots should be good till the end of May at least, but much depends on place of storage and attention given during the winter. When properly cooked and served to table, a really good, rich-coloured Beet is delicious. It would be well were Beets far more largely consumed.

Broccoli.—These are fairly hardy, and biennial, that is to say, they are raised from seed one year and produce their frothy heads for eating, and later their flowers proper in the following year. Their time of heading-in ranges from January to June. Seed of the earliest varieties, those to head in early in the year, should be sown in March or April, to enable strong plants to be dibbled out into rows, 2 feet apart, in June, or early in July. Later varieties may be sown in May, and be planted out in August and early in September. It is undesirable to have the plants too gross or leafy, as these are more liable to injury by frost; again, large heads are undesirable, as those that are from 6 to 8 inches across, when cut, are quite large enough for cooking. When the ground is rich enough with manure dressings, it is well to tread it quite hard about the plants, as that induces them to become less leafy and much harder in the stems. It is a good plan to put out Broccoli plants on to ground that has just been cleared of Peas or other crops, and has not been dug again. The purple-sprouting Broccoli is a most useful as well as a hardy variety, the sprouts being gathered as needed, and thus the plants continue to produce them for several weeks. Seeds of that variety should be sown in April or May, the sprouts being ready for use in the following February and March. Seed in all cases should be sown thinly, in drills, 12 inches apart. The best white Broccoli are—Early: Christmas White, Winter White, and Early White; and for later cutting: Cooling's Matchless, Knight's Protecting, Mammoth, Late Queen, and Model.

Brussels Sprouts.—These distinct forms of Cabbage do not produce hearts, but each stem gives a comparatively small head, and a very large number of sprouts which, if of proper form, are about the size of walnuts, quite hard, round, and green. The plants when put out into the open ground from the seed-bed as early as June become strong and tall, and commence to produce sprouts of this nature at the bottom of the stems in November; and as these are cut off and used, others higher up swell, and in a week or so are large enough for use. Thus stems that are from 20 to 24 inches in height will, in this way, give a supply of good hard sprouts for fully five months. The sprouts come out from the upper side of every leaf-stem, and as they mature, the leaves ripen and fall, or may be pulled off, but in no case should they be removed until the sprouts are to be cut. Cutting takes more time than pulling, but as, in the spring, other long, tender shoots break out from the stems that furnish delicious greens, it is best to cut the sprouts, as then their more dormant buds are left to break into shoots. The tips or heads should not be cut until late in the winter, or as long as these remain. Stem growth goes on, and sprouts are produced, even though they are only small ones. Seed should be sown about the middle of March in shallow drills, and protected by nets or litter from birds. It is well to put out plants when 6 inches in height, as then they make strong growth and begin to sprout early in the winter. The usual rule, if planted in a bed, is to have the rows 2 feet apart, but in rich ground they should be wider than that. The soil, after planting, may with advantage be made very firm, as that tends to make the stems hardier. Good varieties are Exhibition, Dwarf Gem, and Imported Brussels.

Cabbage.—Although all the various members of Brassica are of the Cabbage tribe, having all emanated from the wild Cabbage, yet there is great differences in them, as may be found in Cabbages proper, White, Red, Savoy, and Colewort, Curled Kales, Brussels Sprouts, Cauliflowers, and Broccoli. Under the term Cabbage, therefore, we treat of those properly so named. What are called White Cabbages are all hearting, and whilst leaves exposed to the light are green, the hearts, being firm and blanched, are white. These constitute one of the most valuable of vegetables, being very hardy, and available for use nearly all the year round. Sowings of seed may be made frequently, the earliest in the year being in a frame in February; or failing a frame, then outdoors on a warm border early in March, the object being to secure a quick succession to the Cabbages obtained from an autumn planting. The seed-bed, which may be a small one, should be either covered up thinly with dry, clean straw litter or ferns to keep off birds, or be netted over for the same reason. A second sowing may be made in May to give plants to furnish heads in the autumn, after Peas are over and the hot weather

has passed away. Yet, a further sowing may be made about the middle of August in the open ground. This sowing, as it is well to have plenty of plants, should be in shallow drills, 10 inches apart, the seed being thinly sown, as then the plants can develop well for planting out. It is a good plan indeed to sow all these Cabbage seeds in drills in this way. The plants thus obtained from an autumn sowing should be ready to plant out on good ground in rows, 20 inches apart, early in October, putting them in with an ordinary hand dibble, and in all cases well fixing the plants in the soil. From such a sowing there should be good hearts to cut from during May and June—much depends on the variety; but it is a good plan to have two, one small and quite early, such as Ellam's, and one later, like All Heart or Imperial. It is a common rule to allow the weaker plants from an autumn sowing to remain in the bed all the winter, and then plant them out in March to make hearts for succession. All of the ordinary type of Cabbage, after hearts have been cut, will produce sprouts that are valuable also. But it is best to leave only the autumn planted stock for that purpose, as the cut stems break strong, and give good sprouts for some ten months longer. The chief times to have Cabbage good are from April till mid-summer, and from the end of August until the end of the year, when Coleworts and Savoys succeed. To have them good during hot, dry weather, it is needful to water liberally, and place a liberal mulch of manure about the plants. When caterpillars appear, a sprinkling of fine salt on the heads at night, and washed off in the morning with water, does great good in destroying the pests and helping to manure the plants. Generally it is well to have plants to put out in the open ground in March, May, July, and October to have a long succession. Varieties are plentiful, good early small ones are Ellam's Little Gem, Little Pixie, and Flower of Spring; and larger ones are Nonpareil, Imperial, All Heart, and St. John's Day, specially for autumn cutting.

Cabbages, Red.—These are grown exclusively for conversion into pickles, being of somewhat harder texture than cooking Cabbages. The seed is sown usually in the early spring, generally in April, outdoors with other varieties, and the seedlings transplanted when strong enough into a row, as few heads are, as a rule, sufficient for ordinary use. The culture required is simple enough; the plants need only to be planted in good garden soil, 15 inches apart, and kept clean by frequent use of the hoe. Very large heads are undesirable; indeed, to enable large ones to be produced it is needful to plant out much farther apart. The old Red Cabbage produces very large and useless leafage with great heads. The Dwarf Blood-Red variety is preferable, as if the heads are smaller than the others they are firmer, of deeper colour, and much sooner come to maturity. Seed may also be sown in the autumn for spring planting.

Cabbages, Colewort.—These hardy greens bear a close resemblance to Cabbages, but are usually sown early in June, and again in July, in small beds, to give successional plants to put out in the autumn. As the heads are not large, and they turn in quickly, it suffices to plant from 12 to 14 inches apart each way, both in August and September, on ground that has been forked over after a crop of Potatoes, Peas, autumn-sown Onions, or similar products has been removed. They then turn in for pulling or cutting during mid and late winter. The flesh of these Coleworts when cooked is softer and more succulent than is that of Cabbages, and being planted so close, become very profitable. Like all Cabbage tribe seeds, it is best to sow in shallow drills, and also to protect from birds. The two common varieties grown are the Hardy Green and the Rosette, the latter being broad-headed.

Cabbages, Savoy.—Possibly these hardy winter Cabbages originated in Savoy. They are, besides being hardy, peculiar for producing partially-curled and much-puffed or corrugated leafage, which is usually of a dark green colour. The heads are roundish, and during the season become very firm. They are best for cooking from December till the end of March, severe weather helping to make the leafage tender for eating. The times of sowing seed varies from April to June, according to variety and habit. Too often, if seed be sown early, these Cabbages heart in during the autumn, when they are not wanted. Plants from later sowings, especially of dwarf varieties, heart in late in the winter. The Drumhead is the largest, but is least fitted for gardens. The best varieties are Dwarf Green Curled, Tom Thumb, and Early Ulm. Plant the first 18 inches apart, and the latter two at 15 inches each way. After cutting, the stems give nice greens to gather in the spring.

Cabbages, Kale.—These, also called Borecole, are, like Savoy Cabbages, essentially late winter and early spring greens, and very hardy. Sowings made in April usually suffice for all ordinary purposes, and are best made in drills. There are numerous varieties, the best being Dwarf Curled, Scotch, Cottager's (tall), and Chou de Milan or Hundred Heads, as this latter gives sprouts for picking very late in the spring, when all other greens are very scarce. The two taller varieties need to be planted in rows 2 feet apart and 18 inches apart in the rows, whilst the first named may go closer together. The Asparagus Kale is much liked by some also. These greens can often be profitably planted for succession

between dwarf Potatoes or Peas, and always planted to follow after any of these or other early crops have been taken up, even till the end of September, as their produce is always useful.

Cardoons.—These are raised from seed sown in shallow boxes under glass, the seedlings being transplanted into rows outdoors when strong, or seed may be sown in drills on rich deep soil outdoors at the end of April, the plants being, when strong enough, thinned out to 12 inches apart; the rows should be 4 feet apart to enable the plants to be moulded up, as Celery is, to blanch the leaf stems. These should be gathered up together before soil is placed to them, as the leafage is very large and spreading. When stems are strong and well blanched, they are from 20 to 24 inches in height, but for ordinary use smaller ones are best and not so coarse to eat. When stems are cleaned they should be cut into lengths of 6 inches, tied into bundles, and then gently but well boiled before they are served to table.

Carrots.—The earliest of all Carrots are the Early French Horn forms, such as are commonly forced on hot-beds or sown very early on warm garden borders. Where there are spare wood, movable frames, and plenty of manure and tree leaves to make up a hot-bed, one may be built up in January in a sheltered and warm place, on to which, when settled down, the wood frame may be placed. Into that should be put good soil 6 inches in depth, well levelled, and on which, in shallow drills 4 inches apart, seeds of the Early Horn, Forcing, or Gem may be thinly sown, then covered up with fine sandy soil, also thinly, well watered, and left after the light has been shut down close. A hot-

CARROTS PROPERLY THINNED

CARROT ROOTS. EFFECT OF NOT THINNING

This applies to almost every seedling, and is the result of thick sowing and insufficient thinning.

bed made up 2 feet in depth, and very firm, of one-half stable manure and the rest of tree leaves, gives a gentle warmth for some time, and answers admirably to help the seed to make growth. There will be nice Carrots usually from an inch to an inch and a half long, and about the size round of a man's small finger, to pull in a few weeks, and most delicious they are. Thinning the plants is not required. A similar sowing may be made in February on a piece of ground the size of a frame, on a warm border, without any hot-bed. Round the bed may be fixed, on edge, stout boards 12 inches deep, and on these be laid the glass-light of a frame of that size. Failing a frame, strips of wood may be laid across, and on these a thin covering of canvas or calico, until growth begins, then the covering should be given only at night. Early in April sowings of the Early Nantes, Champion, or Model, short, blunt-rooted Carrots, from 5 to 6 inches long and of delicious quality, should be made in light, well-pulverised, and deep-worked soil. Drills for these should be 10 inches apart, the seeds being thinly sown to save labour in thinning the plants later. Formerly Carrot seeds were coated with hooks, or bristles, that caused them to cling close to each other; now the seeds are freed from these hooks by cleaning, and can be sown with the greatest ease. It is a good plan to dress the ground, and well point it in with a fork before drawing the drills, with a mixture of wood ashes, soot, and guano, the latter in the proportion of one-tenth to the others.

Carrots, Main Crop, are of longer form, and should not be sown until the end of April or early in May. The best variety for this purpose is that known as St. Valery, New Intermediate, or Matchless. This is a broad-shouldered Carrot, tapering hand-

somely to a root-point, and is usually from 10 inches to 12 inches long. It is the heaviest cropper of all Carrots grown. The soil for the crop should be deeply trenched, and, if manured, the dressing should be added in the early winter where the trenching is done. In the spring the surface should be lightly forked over, and a dressing added as previously mentioned. Drills, as drawn with a broad hoe beside a garden line, should be 12 inches apart and comparatively shallow, as it is only needful to bury the seed about half an inch in depth. Sow seed thinly, and cover up quite evenly with fine soil, raking over the entire surface of the bed, and leaving it until good growth has followed. The first labour should be directed to thoroughly hoeing the soil between the rows; then when the young plants are well up, these should be thinned in the rows to some 6 inches apart. A free use of a hoe between the plants during the summer is the chief attention requisite. Very large Carrots, especially if the seed be sown early, are apt to split. Without doubt, the best flavoured roots for cooking are those of medium size and of clean growth.

Summer Sowing.—Although it is sometimes difficult to get Carrot seed to germinate when sown in July, yet it should be the aim of all who like these roots young and tender during the winter, to make a good sowing of seed in that month. Just then early Peas, Potatoes, and other crops being removed leaves ground available for a sowing of Carrot seed, not necessarily a large one. The best varieties are the blunt-rooted Model or the New Intermediate, because, whilst of good size under ordinary conditions, the roots from a July sowing are not so and need little thinning, as the chief object is to have plenty of comparatively small roots to pull that are soft, succulent, and of delicious quality all the winter. One excellent result of such a summer sowing, made in drills 10 inches apart, is that the tops keep green all the winter. It is needful when severe weather sets in to cover up a portion of the bed with long straw-litter or ferns so as to exclude frost and enable pullings to take place. Main crop Carrots have to be lifted from the ground and stored, when cleaned of dirt and side roots, in dry sand or ashes in any cool, airy cellar or outhouse, the crowns being in all cases outwards. So cared for the roots keep well for many months. It may be needful now and then to run each of the roots through the hand to remove root or other growths, replacing them in the sand or ashes as before. Where there is a summer sowing the main crop or large roots may be used for soups and stews, whilst the younger ones are best for table. Carrots are very nutritious food, and when well grown as advised are fit for any table.

Cauliflowers.—These are more tender in constitution and texture than Broccoli. They are also properly annuals, as the plants can be readily induced, by early sowing of seed under glass, to produce heads, and from these flowers and seed the same season. Cauliflowers also are so far tender that they will not endure exposure to ordinary winters in this country. There are dwarf and tall, early and late varieties, the earliest being Snowball or, as sometimes called, Matchless, Earliest Forcing, and Earliest Dwarf Erfurt. These, when mature, produce close, compact, very white heads, some 6 inches clear and almost close to the ground. To have these forms giving heads early it is well to sow seed in shallow boxes or pans in gentle warmth either in a frame or greenhouse during February. Growth is then quick, and the plants should be, when 4 inches in height, dibbled out into other boxes 2 inches apart, and be grown on in a cool house or frame, kept near the glass so as to induce them to become stout and sturdy. From the boxes each plant, being lifted with a trowel and balls of soil and roots attached, should be planted out on a warm border about the middle of April in rows 18 inches apart. For this purpose the soil should be well manured and deeply dug. From such a planting generally heads may be cut early in June. It is possible where a frame is at disposal to plant up some into it 12 inches apart and thus secure white heads some two weeks earlier. Some gardeners even put plants singly into 6-inch pots, and stand them in a vinery or peach house where they head in very quickly, though small. Still Cauliflowers are not generally much forced. If a further sowing of this early strain be made in March or April plants give heads outdoors in due succession. Sowings may be made of later and larger varieties, both in frames and in beds, or in drills outdoors in April, as these need a much longer season to mature. The best tall summer variety is the Early London, and others equally good are The Pearl and King of Cauliflowers. These from an April sowing, then planted out at the middle of June, give fine heads during August and September, especially if well watered when planted and the soil has been well manured. Cauliflowers, because they have to make their chief growth during hot weather, need more liberal treatment in soil and watering than Broccoli. A later and rather hardier variety also to be sown in April is Veitch's Autumn Giant. This is a superb variety to head in during September and two or three following months. Plants should be put out into rows fully 2½ feet apart, and in good, deep holding soil. If one planting be made in June and a second a month later then a long succession of heads is produced. Late heads may be partially protected from early winter frosts by drawing the large leaves together and tying them into a cone. That should be done as soon as white heads show. Even a few large leaves broken down, so that they lay two or three thick over the centres, protect in the same way. Cauliflower

and Broccoli stems, after the heads have been cut, do not sprout, hence they may be pulled or forked up and removed at once.

Celery.—This is the chief of winter salads, and, when well prepared, is in universal favour. But its excellence depends so much upon culture and proper blanching that Celery may well be classed amongst the best vegetables of a garden. It is a hardy, cold weather plant also, yet sometimes suffers severely from hard frosts, because the blanching of the stems serves to make them somewhat tender. Seed is cheap and a very small quantity suffices to make a sowing for a small garden. Two sowings also are ample. The first should be made rather thinly in a broad, shallow pan filled with light, sandy soil. In a pan, 10 inches broad, some 200 seedlings can easily be raised, enough to make quite a big planting for a small garden. Make that sowing about the middle of March, standing the pan in a frame or greenhouse, and shading when the sun shines out warmly. The seed of Celery germinates slowly, but comes all in good time. When the seedlings are 2 inches in height they should be lifted carefully from the pan and be put out 3 inches apart on to shallow boxes of soil or into a frame or under a hand-light where they can remain until 6 inches in height and quite strong, ready to plant out into trenches. The second sowing, to give later plants, may be made in the same way, or, if preferred, in a shallow box, towards the end of April. The plants of this sowing, when strong enough to lift, should be dibbled out on a well-prepared patch of ground, slightly shaded, in the open garden. For such purpose throw off an inch thick of the top soil on a space 4 feet by 6 feet, then lay on the space short manure, an inch thick, well patted down, and on to that recast the soil previously thrown off and neatly levelled. Then dibble out the seedling plants on to that, 4 inches apart each way, taking sixteen plants in a row, and if the whole patch be thus filled it will hold upwards of 350 plants. When planted, water freely, and as it will then be June shade from strong sunshine for some ten days until the plants are well rooted. Water freely each day if needed. In six weeks very strong well-rooted plants will result.

Trenches for the reception of Celery plants are desirable, not only because they facilitate moulding up to blanch the stems later, but also enable liberal waterings to be given, and where made side by side trenches should be fully 5 feet apart. Also they should be thrown out 18 inches wide and 12 inches deep. If the bottom soil be good add a dressing of well-decayed manure 3 inches thick, and well fork it into the bottom. If the subsoil be poor, or gravelly, or clay, throw out 8 inches depth of it upon one side, throw in so much of the top soil, then add to that and mix the needful manure dressing, and on that fork in a couple of inches more of soil. Then the trenches will be ready to plant. Do that with a trowel, lifting a dozen or so plants from the bed at once with good ball of soil and roots, taking them in a flat basket to the trench, and then with the trowel planting them well in a single row up the centre of the trench at 10 inches apart, fixing them securely by treading with the feet as the planting proceeds. If at once a liberal soaking of water be given the plants will not suffer much from the transplanting. No set time can be fixed for this work, as much depends on when ground for trenches can be at disposal. Usually for late Celery the end of July is soon enough to get it out, and by that time some early Potatoes, Peas, or other crops have been cleared off and space is at disposal. In the case of an earlier planting it is desirable if possible to reserve a space specially for a trench or two, but that must depend on garden room, otherwise the first ground cleared from some other crop must be used.

Celery plants are gross feeders, and during dry weather need frequent liberal waterings; and if once a week the plants can have a good soaking of liquid manure, made in a large tub from horse, sheep, or fowl's manure, with some soot added, or failing these things, then with some dissolved guano or other artificial manures, at the rate of 1 lb. to 10 gallons of water, great good will result. Fairly quick growth is always best. Earthing should not commence until the plants have made strong growth, as after it has begun watering cannot go on. This work should always be done in dry weather; any very short leaves or suckers about the bottoms of the plants should be first pulled off. Moulding up is facilitated if the tall stems of each plant be tied up together, not necessarily tight, as then with a fork or spade the soil can be placed about the plants evenly, being gently pressed in about them with the hand. The first moulding should not exceed 6 inches in depth, other mouldings, of some 3 or 4 inches in depth, being added as the plants make growth, until finally they are well banked up with soil on both sides, and patted down to throw off rain. Late Celery may be in very severe weather saved from harm by shaking over the tops of the plants some fern or long straw-litter. The chief insect-pest is the maggot, caused by the celery-fly, which deposits its eggs in the leaves. These soon hatch and produce maggots, which subsist on the green colouring matter in the leaves, and make brown blotches in them. As soon as these blotches are seen they should be pressed firmly between finger and thumb, thus killing the insect. Good Dwarf White Celeries best suited for small gardens are White Gem and White Incomparable; and of reds none are better than Standard Bearer and

Major Clarke. These latter are best for late winter use, being usually hardier than white varieties.

Celeriac.—This is a turnip rooted form of Celery, and is useful when well grown to give bulbous roots for stewing or for slicing, to make salading, or may be used equally for flavouring soups, &c. Seed, of which one sowing is ample, may be sown in April. The plants are hardier than Celery, and one great point is that, if grown from seed as Celery is, then when the plants are strong, put out, 9 inches apart, in rows 2 feet apart, on level but good ground, the bulbs form on the surface like those of turnips, and in the winter they can be covered up with soil, the tips of the leaves only being exposed, and in that way kept from harm by frost. Celeriac should always be grown where flavouring for soups is in great demand.

Chicory.—This is a deep growing, fleshy-rooted plant similar to the Parsnip. The leaves closely resemble those of the Dandelion. Seeds sown in shallow drills, 12 inches apart, in the month of May on good garden soil will give properly thinned, strong roots the following winter. Seeds should be sown thinly in the drills, as the plants have to be thinned out 4 inches to 5 inches apart in the rows. The hoe should be freely used between them during the summer. In the winter the roots may be lifted as needed, or in bulk, and stored in dry sand in a cool shed; then, if some be placed in a cellar or in a big box with soil about them, and covered up quite close to exclude light, the crowns send up strong growth like Seakale; when blanched it is tender and mild, making capital salading, or may be cooked like Seakale and eaten. It is a useful winter vegetable. The best variety is called Witloof.

Cucumbers.—Because these tender members of the Gourd family can rarely be grown successfully except under glass, they tax the capacity of beginners in gardening materially. The simplest culture is only required to produce Ridge Cucumbers, and small ones of the same nature called Gherkins. These are grown outdoors in warm positions, and if wind prevails in the garden much shelter can be provided by growing on the windward side a tall row of Runner Beans. Even a bed of Asparagus will also furnish a break from wind. The best course to grow these products is to make holes 18 inches across and 12 inches deep. Fill these holes with short fresh stable manure, treading it down and heaping soil over it 4 inches thick, thus forming a mound. In the centre of each of these mounds sow, 4 inches apart and 1 inch in depth, six seeds. Place a large flower-pot over each mound until growth is seen. Then lift it off, covering up only at night, or at least until the plants become too strong to be thus protected. But when second or third leaves have been formed, three of the weaker plants should be pulled out, leaving the three strongest only. The mounds should be 3 feet apart. The sowing should take place about the third week in May, but later if the weather be cold. The manure buried into the holes generates a little warmth which helps the seeds to germinate. For that purpose it is well to prepare the mounds about a week before the ordinary date of sowing seed. The best varieties for this form of outdoor culture are King of the Ridge, Long Green, and The Gherkin, the latter being used for pickling.

Cucumbers, Frame-House.—All the long handsome cucumbers seen in shops and in markets are grown in warmth, under glass. But beginners in gardening, who have probably only a frame or small greenhouse at their disposal, can grow them only in a small way. To have the fruits early, the most useful way in this case is to obtain stable manure early in the spring, and to make up a proper hot-bed for the purpose. To do this well the manure should be obtained all at once, and in sufficient quantity. If a frame be of the ordinary one-light size, 6 feet by 4 feet, a good cartload of manure will be needed, and for a double-light frame quite two cartloads are needful. When obtained, the whole of it should be well turned into a neat heap, and shaken or mixed, removing the bulk of the long straw. That, of course, reduces the quantity, but it is needful. When the heap has been thus made, a long-pointed stick should be thrust deep into it. After four or five days that can be pulled out and felt to test heat, and if found hot the heap should be at once re-turned and well shaken together; also the manure during the process should receive several good sprinklings of water, not to deluge it, but to damp it equally. After remaining for some six days, and being again tested, the heap may be taken and built up into a hot-bed, on which the frame is to rest. That bed must be 12 inches longer and broader than the frame, that it may securely stand on it. The bed should be firmly trodden when made, and be rather higher behind than in front, being in a sheltered place, and facing the south. So soon as made the frame can be placed on it, with a mound 6 inches deep in the middle of good turfy loam, with which is mixed a very little well-decayed manure. An inch thick of the soil may be spread over the rest of the bed. The glass light may then be put on. Any spare litter or straw can be packed round the bed to exclude wind and air, and over the frame mats may be laid. When the frame is found to be filled with steam, tilt the light a couple of inches at the back to allow it to escape. When that steam declines the Cucumber plants may be put out into the mound, the roots being well buried, but very little of the stems. For a single-light frame two plants are

ample. After planting give a good watering with tepid water, and shut down the light. It may be well to shade a little in hot sunshine, but the glass should be covered with mats at night. In a couple of weeks tiny white roots will be seen coming out from the mound of soil. Then another inch or so may be added all over the bed, and that will suffice for the season. A gentle watering should be given each other day, and the leafage syringed each afternoon just as the sun is going off.

After Culture consists chiefly in keeping shoots fairly thin, admitting a little air, frequent dampings or syringings, and should green-fly appear on the leaves, giving an occasional smoking with tobacco, filling the frame with smoke, and covering it up close for a few hours, when no doubt the insects will be found dead. A hot-bed of this description should not be made up until the middle of April, as by the time the heat is gone the sun will be warm enough to satisfy the plants' needs. Attacks of red spider or thrips on the leaves, causing them to turn brown and wither up, are the result chiefly of keeping the soil and plants too dry.

House Culture.—For forcing Cucumbers early the best description of house is one that is low and narrow, having beds on either side of soil on which the plants may be grown, and plenty of hot-water piping to keep up a good heat. But where there is only a small house with little heat the beginner should, as for a frame, purchase strong plants in pots from a florist rather than attempt to raise them, as that involves so much trouble and loss of time. In such a house a very large flower-pot or a box 12 inches wide and broad, and 10 inches deep, will do for the soil, or that may be with some turf at the bottom and sides built up in the form of a mound, 2 feet across and 12 inches deep in the middle, the plants being put out in or on these things singly. If pits or boxes be used they should have large holes in them to allow water to percolate through. The best drainage consists of rough pieces of old broken turf, the soil as advised for frames being placed upon it. If there be no artificial heat in the house it will be best to wait before planting until the end of May, when strong plants may be put out safely. Such plants after they make a strong leading shoot, which at 12 inches long has to be pinched back, soon produce several shoots. These must be trained to wires or laths secured just about 10 inches under or below the glass roof, and in time these shoots will cover a large area in this way. It will be needful occasionally to cut or pinch out some of the non-fruitful shoots, or otherwise the plants will become far too crowded. Male flowers, which are not fruit producers, come first and numerously. Female flowers appear on the points of the fruit, and usually open after the fruits are from 1 to 2 inches in length. It is needful to fertilise these by using pollen from the male flowers only when seed fruits are needed, but to get proper fruits for table, fertilising the flower is wrong, as the fruits are less fitted for eating.

House Cucumbers need frequent syringings, indeed quite twice daily, except when the weather is dull and cold. The door of the house where the plants are may be partially open during the day, but must be shut close up at night. Damp down then to generate a moist atmosphere which the plants like, whilst plants thus grown will need a liberal watering every other day. Later, when several fruits have been out, it is well to make some weak liquid manure and give them a good watering with that at least once a week. It is wise, however, in all cases not to allow water to come into close contact with the main stems.

Varieties of Cucumber for glass culture are numerous, amongst the best being Lockie's Perfection, Telegraph, Rochford's Market, Peerless, Matchless, and Sensation, the latter three being specially good for exhibition. For ordinary frame culture Lockie's Perfection and Telegraph are the best.

Endive.—This is a leaf salad, hardier than Lettuce, and suited only for winter use. When properly grown and blanched white, the leaf hearts of the plants make excellent food. One sowing of seed usually suffices for ordinary needs. That sowing may be made about the third week in July, thinly, in a bed in the open ground. When the plants are strong they should be lifted carefully and dibbled out in rows 12 inches apart, on borders or beds made to slope somewhat to the south. There, needing only an occasional hoeing, they remain and become quite strong. There are two forms, the Curled and the Broad-leaved or Batavian. Both are hardy. When fully grown the former is best blanched by covering the plants close on a dry day with boards or slates, tiles, or similar materials, as by thus excluding light and air the hearts become white and tender. When such is the case they can be cut and eaten. The Batavian Endive, being of more erect habit, can be blanched by tying up the leaves closely. A second planting rather later can usually be made from the one sowing, and thus a succession is obtained. In some cases, plants when of full size are lifted with balls of soil attached to the roots, and blocked in close together in a dark frame, or cellar, or outhouse, but kept absolutely dark, and in that way are easily blanched. Some, failing other conveniences, may be put, a dozen at a time, into large boxes, which can be covered up close with lids or newspapers. Snowfalls, succeeded by frosts, are injurious to Endives, hence some protection given

through the aid of fern or long litter is useful. But where ordinary care has been taken in planting, and strong hearts result, the blanched product always fully repays for the trouble taken.

Leeks.—These edible stem plants deserve far wider culture than they usually get. Possibly some prejudice against them exists because they belong to the Onion family, but their perfume and taste are not strong, and they are really excellent as a cooked vegetable when properly blanched, as the process of blanching the stems takes away all strong flavours. Leeks can be easily raised from seed, and a gardener in a small way may raise sufficient plants for his first crop by sowing seed in a 10-inch shallow pan filled with fine soil, standing it in a frame to promote germination. That may be done early in April. The young plants, when 4 inches in height, may be lifted from this seed-pan, and be dibbled up thinly into shallow boxes, or under a hand-light, or in a frame, where they become strong and well-rooted in about a couple of weeks. From thence lifted carefully with balls of soil and roots, and transplanted into a trench as prepared for Celery, growth soon goes on, and in a little time some soil may be put around the stems, this going on all the summer, and by the end of August, or soon after, the plants will have stout stems, blanched as white as snow, to a height of from 10 inches to 12 inches. These may be lifted and trimmed, and cooked as required. A second sowing may be made outdoors about the middle of May. From this plants can be put out, as before described, late in the summer, and they will be hardy enough when well earthed up to stand the winter, and give stems over a long season and at a time when vegetables are scarce. Stems such as are usually furnished at exhibitions are very large, quite as big round as broom handles. These are far too big for ordinary table use. Those about the dimensions of an ordinary walking stick are better. Many persons are content to dibble their plants out into rows 18 inches apart, letting the stems down in dibbling them quite 4 inches, and then later, as the plants grow, adding a little soil to them. But it is much better to prepare trenches with manure buried into them, as is done for Celery, as growth is quicker, and the blanched stems are, when cooked, more tender. There are a few slightly diverse varieties of Leeks, but under ordinary cultivation one is about as good as another. For exhibition, the Champion, Exhibition, and Lyon are esteemed the best, and they are equally so for ordinary garden culture.

Lettuce.—The most popular and widely-consumed of all leaf or heart salads is Lettuce, and it can be had good for a long season. There are two diverse forms, one being tall, and erect, called Cos, the other of dwarf form, somewhat squat, and herating, and called Cabbage. There are white, green, and reddish lines in both sections, and some of the latter are much curled. Both are good, although some consumers prefer the latter form for eating. Seed is cheap and plentiful. Sowings may be made at frequent intervals, beginning in March under glass, sowing thinly in a shallow box or pan, and standing it in a frame or greenhouse; then having the young plants, when a few inches high, lifted out and dibbled 2 inches apart into other boxes, or else into a frame, or under hand-lights, for a few weeks, when they are strong enough to plant outdoors on to a warm border to give a supply for early cuttings. Both Cos and Cabbage forms may be so sown. A further sowing may be made on a warm border, and rather more largely, early in April, and others, always quite small ones, in succeeding months, as in that way a supply of plants for cutting is kept up. The latest sowing should be made about the middle of September, in a frame filled with soil to within a few inches of the top. Such a sowing should be of Hick's Hardy Green Cos, and Black Seeded Brown Cos. These are amongst the hardiest, and can be kept as strong seedling plants through the winter, ready to plant out in March in a sheltered position. The latest sowing for outdoors in the summer should be made about the middle of August of the above-named varieties and of Hardy Cabbage varieties. These can be planted out at the end of September beneath walls, or on warm, sloping banks or borders, to stand the winter. Summer Lettuces are most valuable, because the leafage is so cool and pleasant to eat in hot weather. A good variety to stand heat is Paris White Cos, but when planted from June onwards the position should be partially shaded, the soil deeply worked, and where ample water can be given. When the position is hot and dry the plants do not heart in, but bolt off to flower. Whilst in the summer, beds planted with Lettuce may be made to slope to the north, in the winter they should slope to the south. Very thick sowing results in the production usually of far more plants than are needed, and so many that are weak and drawn. Thin sowing and early planting out thinly from seed-pans or beds prevent weakness and a drawn growth. Lettuces, being in the young stage tender and succulent, are much relished by slugs and snails. It is therefore, in planting out, needful to dust about the plants freely, especially at night, with fresh-slacked lime or good soot. This needs to be followed up for a couple of weeks after each planting until the plants become hard. Cabbage Lettuces need no tying, as naturally they heart in firmly, neither should any good stock of tall or Cos Lettuce; the practice of tying them with bast or raffia is carried out chiefly to assist the hearts to form and become blanched earlier.

Varieties.—Of Cos or tall varieties the finest is the Champion White Cos; the best

generally is Paris White Cos and Hardy Green Cos for summer, and the latter and Black Seeded Brown Cos for winter. Of Cabbage varieties, Hardy Hammersmith and Grand Admiral are good for winter, and White Dutch, Stanstead Park, All the Year Round, Tom Thumb, Model, and Epicure, the latter two being curled.

Mushroom.—This acceptable fungus is artificially grown both outdoors and indoors. The common method for outdoor culture is to make up beds in ridge form of stable manure and spawning them. The manure must be that of horses, and of those that are healthy only. This should be one-half of droppings, the rest of rather short straw. When there is much long straw the greater portion should be shaken out. The manure should be kept in an open shed, or if otherwise, when in a heap, covered up with mats. As soon as collected it should be well shaken up, mixed, and put into a neat heap. If it seems dry, then it should have, as the turning takes place, a liberal sprinkling of water. The turning should be repeated in some five or six days, or when the heap is found to have become hot again. If found dry, more water should be given. A third turning may be needful to get the manure into good condition, and after that it can be built up into a bed, having a base 2½ feet wide and the same height in the centre, trodden firm as put together. The heat of the bed should be tested with a stick forced into it, and as soon as found to be hot pieces of mushroom spawn, such as are purchased in dry, square cakes from seedsmen, should be well forced into the surface of the bed at some 8 inches apart all over it. The cakes may be cut each into some eight pieces. Next coat the bed over with rather close loam from a pasture, give a good watering, using tepid water, then cover it up well with a thick coat of straw litter, and if it be winter then cover with mats also. Beds of this description produce mushrooms in about two months. They can be made from September until April. If beds be made slantwise or sloping under a wall or in a shed or cellar they must be from properly prepared manure as described, be solid, spawned, and covered up. The spawn cakes should have been made certainly less than a year from the time of purchase.

Onions.—Sowing seed of these somewhat odorous bulbs was formerly limited to two seasons—the spring and late summer. Now it is a common practice to sow seed under glass in midwinter, putting the plants outdoors in April to grow into extra large bulbs. Being somewhat deep rooters and gross feeders, Onions need both a deeply worked and well-manured soil. Many growers adopt the rule of putting Onions on the same ground every year; others alternate the crops, Onions one year, Cabbages or Peas the next. But whether the ground be so cropped or whether several crops follow the Onions, it is indispensable that the ground be always trenched fully 2 feet in depth during the winter to secure a good crop of bulbs, and have a heavy dressing of well-decayed manure worked into it, especially putting some down deep to attract roots to it, and thus furnish them with a liberal supply of food and moisture during dry weather. A method of getting ground into fine condition for Onions is, after trenching and burying a dressing of manure deep into it, to give to the surface a further dressing of well-decayed short manure, forking that in several inches deep, then leaving the soil to settle down for several weeks before sowing the seed. It is the nature of Onion plants to send roots down deep and direct, but they like the soil fairly firm on the surface, as that tends to force the plants into bulb formation all the sooner.

Times of Sowing Seed.—What is commonly called the spring sowing of the main crop is usually made in the month of March or early in April. The condition of the soil and nature of the weather must determine the exact time, but it is always well to remember that the tops of very early raised plants often suffer from sharp spring frosts. The usual practice is to strain a garden line across the plot of ground to be sown, and by its aid then with a hoe to draw shallow drills 12 inches apart, sowing the seed thinly along these, and covering it up with soil. If the soil be naturally light, loose, or porous, it is wise before drawing the drills to either tread it over evenly or to run a light roller over it, as that makes it firmer. After filling in the drills the whole plot should be neatly raked over. The customary autumn sowing is made from the 20th to the 30th of August under similar conditions, but in this case the ground need not be specially prepared if it has carried a crop of early Potatoes, Peas, or some other vegetable, and for these has been previously trenched or deeply dug and manured. It may be but needful to lightly fork over the surface to level it and enable the seed to be sown. As the plants have to stand outdoors all the winter it is unwise to have the soil too rich, as if the plants be coarse or unduly gross they may be killed by severe frosts. The seed sowings may be moderately thin in both cases, as where the plants are thicker in the rows much labour is necessary later in thinning them, and there is also much waste of seed. Even though many plants be used for salading in a young state it is not well to allow them to remain to become large enough for that purpose in the rows that are to be thinned for the main crops. It is so much better to sow one or two extra rows more thickly with seed expressly for pulling when large enough, and clearing the plants entirely as wanted. From the autumn sown breadths it is good practice in March to lift

some plants carefully so as to preserve the roots, and to dibble them out into rows 12 inches apart, the plants being 6 inches from each other in the rows. If the planting be carefully done so that the roots go down well into the holes and be firmly fixed, the bases of the plants just being covered, and the ground has been well prepared, much finer bulbs usually result than in the rows of the plants left where sown. As a rule the thinning of the autumn-sown plants is not done until March or thereabouts.

General Culture after thinning consists of a free use of the hoe between the rows through the growing season, and an occasional dressing of soot or of some artificial manure or guano in showery weather, having it well hoed in. That washes down and greatly assists the formation of fine bulbs. Still it is best to give these dressings after bulbs have begun to form. It is also good practice to go over the plants when strong and well advanced, and to gently press the stems just above where bulbs are being formed, to cause the tops or leaves to rest on the ground and all one way. That practice not only gives the bed a neat appearance, but it assists the plants to form bulbs, which is the primary object in Onion culture. But very stiff-necked plants should be dealt with carefully lest they break off. The bulbs from a spring sowing are usually ripe to pull ready for storing for the winter about the end of August or early in September. They should remain on the ground to dry thoroughly for a couple of days, if it does not rain. If rain prevails then the crop should be pulled and put under cover before cleaning off decayed stems and final storing in a cool shed or store on shelves for the winter. Where the thinning has been properly done, the plants being about 4 inches apart, usually a very firm, even sample of bulb is produced. Autumn sown bulbs are usually thinned down to 9 inches apart. These are ripe for pulling towards the end of July or thereabouts.

This shows the average size of Onion bulbs raised by sowing seed in drills 12 inches apart in the open and in the spring. These are thinned out to 4 inches apart.

Very fine Onion bulbs raised from seed sown under glass in January and put out in rows in April, 18 inches apart and 12 inches apart in the rows.

Winter-Sowing.—To raise bulbs of great size and weight, the practice is to sow seed in shallow pans or boxes filled with light soil about the third week in December. The seed is sown moderately thick, then the pan or box is stood in a frame or greenhouse where there is a little warmth, and kept near the light; growth follows in a couple of weeks. When the plants are 3 inches in height they must be lifted from the seed-boxes and be dibbled in, 2 inches apart each way, into other shallow boxes filled as before with light soil, well watered; then stood on shelves or near the glass. There they must remain until the plants have become 6 inches in height. Then put the boxes into a cold frame, where the plants get plenty of light and air. Every care must be taken to keep the plants erect, which they will be when well exposed to the light. Planting outdoors is done from the middle to the end of April, the ground for these plants having been previously trenched and manured as advised for the spring sown crop. The rows, marked out with a line, should be 16 inches apart, very shallow drills being first drawn. Into these put the plants at 12 inches apart, lifting them from the boxes with a garden trowel, so as to retain to each a nice ball of soil and roots. Only these balls but no portion of the stems should be buried in the soil, well fixing them, and, if needful, watering in. Because thus early raised, and having so much space between them, the plants make very strong growth, and later in the summer produce exceptionally large bulbs. Good growers commonly obtain bulbs weighing from 2 lbs. to 3½ lbs., perfect samples, hard and well ripened. Usually these bulbs are ready to pull from the middle of July to the end of August, as may be wanted for exhibition or storing. Such bulbs are excellent when baked or stewed, being mild and succulent.

Varieties.—The common pickling form is the Silver Skinned, but almost any ordinary variety sown thick and left to form bulbs unthinned will produce picklers. The ordinary time for sowing these is in April.

Winter-Sowing.—To obtain exhibition bulbs the finest stocks are Ailsa Craig, Cranston's Excelsior, and Sutton Globe, oval-shaped; and Lord Keeper, Ai, and Main Crop, round.

Spring-Sowing.—Fine oval varieties are those above-named and Southport Red Globe, James' Keeping, and Champion; of rounds, Banbury Cross, Zittau, and Rousham Park Hero.

Autumn-Sowing. — Any of the above varieties, or of softer onions, Giant Rocca, White Leviathan, or Globe Tripoli.

Parsnips.—Hardier than are most of the summer grown roots, a sowing may be made so soon as early in March, or at any time during that month, if the soil be in good condition for sowing seed. Generally but one sowing of this root crop is made, as the roots are not required for consumption until the winter, and are not acceptable then until well matured by a long season's growth. To secure clean, well-shaped, though not necessarily long roots, the ground should invariably be trenched during the winter, and have added a moderate dressing of manure well buried down to encourage the main or tap root to go deep rather than favouring the formation of side roots, which fresh manure near the surface promotes. Drills for the seed should be 12 inches apart, and be about 2 inches in depth. In sowing the seed, place it thinly equally along the drills, as otherwise much is wasted, and great labour in thinning the plants later is entailed. This thinning should be done when the plants are 3 inches in height. Prior to that the soil between the rows will be all the better for a free deep hoeing, as that facilitates thinning the plants afterwards. The thinning should be to fully 8 inches apart, but if extra large roots are desired 10 inches apart is not too much. During the summer and autumn the only culture needed is by the frequent use of the hoe between the plants to keep the soil loose and clean. As Parsnips are quite hardy, the roots may be left in the ground all the winter, provided that either some litter or soil be placed over the crowns of the roots in hard weather to exclude frost. It is a good plan, however, to lift every alternate row from a bed, and store the roots in dry sand, ashes, or soil in any cold place under cover, merely cutting off the leaf stems an inch from the crowns. Then there is ample space between the other rows to mould soil over them, but it is quite soon enough to do that early in the new year, as until then frost is seldom hard enough to do Parsnips harm. All experience, however, goes to prove that roots left in the ground keep so much fresher and sweeter than are those earlier lifted and stored. Roots of medium size, clean, and just scraped over and left white, then boiled slowly in sufficient water to cover them in the pot, the water gradually boiling away until the roots are soft, are, when served to table, far more acceptable as food than are roots peeled, cut to pieces, and boiled in water all the time. It is probably largely due to lack of knowledge how best to cook Parsnips that these most nutritious roots are less eaten than they should be. There are few varieties. The most commonly grown is the Hollow Crown, and the whitest selection from that variety is Tender and True, which is so far the best in commerce. A good stock of The Student is very good also. It is better in all cases to secure clean roots of medium size, as they are less watery than are large ones, and furnish the best food.

Peas.—These pod-bearing plants, because productive only during the summer season, have special need for deeply worked soil, to enable roots to go down in search of moisture and food. Where Peas are sown on a light soil that is only dug 12 inches deep, they invariably fail to produce a satisfactory crop in warm weather. When the soil is trenched 2 feet deep, and a good dressing of decayed manure buried into it, then the plants invariably keep vigorous and healthy, and carry a fine crop of pods. These are elementary facts that every beginner in gardening should understand. Then a too common fault in Pea culture is sowing seed far too thickly in the drills. Now a proper Pea drill should be fully 4 inches deep, drawn with a large hoe quite straight beside a line of cord, and be fairly broad at bottom. But in the case of large-seeded, wrinkled marrow Peas, especially if the plants reach from 5 feet to 6 feet in height, a pint should be made to sow 100 feet length of rows. That means thin sowing certainly. If the plants range to a height of 3 feet, then make a pint of seed sow from 80 feet to 90 feet run, and if quite dwarf, that is, from 18 inches to 20 inches in height, then the sowing may be a little thicker. These instructions should be carefully borne in mind, as it is a common fault to sow a pint of peas in a row from 40 feet to 50 feet in length. When plants are thick, naturally they fail to find root room, or plant room later, and suffer accordingly. Then, when rows of Peas are sown side by side, the drills for tall Peas should be 6 feet apart, 3 feet to 4 feet Peas 4 feet apart, and the dwarf ones from 2 feet to 2½ feet apart. Tall Peas should be sown only where the soil is deep, holding, and rich, and when it is intended to support them with branching stakes. Peas of medium height pay well for such staking, but if sown to remain on the ground, as field Peas do, the rows need not be more than 3 feet apart.

Times of Sowing.—Little is gained by very early sowing, except on a warm, sunny border, close under a wall. But even then if one be made early in February, it is soon enough. A second may follow at the end of the month also on a warm border, and from that time two sowings per month may be made in the open ground up to the end of May. That course should give a long succession, especially if the latest sowings be of naturally late varieties such as do best in the autumn.

Varieties.—There are literally hundreds of so-called varieties of Peas in trade, but many of them differ almost only in name. One great feature of present day Peas is that all the best now are of the wrinkled marrow form, and these are much better than are the old round-seeded varieties. All the class known as wrinkled produce seeds when ripe that are much shrivelled in appearance, but when sown soon absorb moisture, then swell up and become double the previous size. These Peas have higher flavour and more sugar in them than the round varieties. Still further they produce much finer and better filled pods, and generally heavier crops. There is little need now to sow any of the old hard-seeded varieties in gardens, indeed they are chiefly sown in the fields for early market gatherings. Of good dwarfs for first early purposes the best are Chelsea Gem, William Hurst, English Wonder, Defiance, and The Daisy. These are all wrinkled Peas, and of first-rate quality. Their heights range from 16 to 24 inches. The two first named are the earliest, the others being from 10 to 14 days later if all be sown at the same time. Where it is desired to keep to these dwarfs only, not only may successional sowings of the latter three be made as needed, but Laxton's Omega, a capital late variety, may be added. It is a special merit of these dwarf Peas in small gardens that they admit of winter greens being put out between the rows during the summer. The medium height section, generally the best in all ordinary gardens, include very many first-rate varieties. In this section May Queen, Early Giant, Gradus, Senator, Triumph, The Queen, Magnum Bonum, Prolific Marrow, Majestic, Peerless, Carter's Seedling, Michaelmas, and Autocrat, constitute a splendid selection, and come into bearing much in the order given. The average heights are from 3 to 4 feet when staked. Those who prefer the taller section, the plants reaching in good ground 6 feet in height, will find none very early, and should retain Early Giant and Gradus for first sowings, following with Duke of Albany, Telephone, Alderman, and Chelsonian, as these are the finest for succession. It must be understood, however, as new and possibly improved varieties come into cultivation, older ones disappear. Still really good ones remain for many years.

Pea Diseases.—One material trouble to which Pea plants are subject arises from attacks of those exceedingly minute insects called thrips. These suck the sap from the leaves, and cause them to turn pale and become thin. When that is so the crop suffers. An occasional syringing very gently with some insecticide helps to destroy these pests. Great heat and drought generate them. In the same way mildew is often generated. That is best destroyed by gently syringing or spraying the plants with the Bordeaux mixture, a solution of equal quantities of sulphate of copper and lime with water. A couple of dressings usually kills the mildew, but does the Pea plants no harm.

The Potato (*Solanum tuberosum*).—Were a teacher about to examine a class as to the knowledge of the members respecting the Potato, no doubt the first question would be, "From what part of the world did it come, and when?" Taking the last point first it is sufficient to say that the Potato was introduced into Europe rather more than 300 years ago, and that Sir Walter Raleigh (the famous navigator of the Elizabethan era) is credited with its introduction into England. But whilst exact data on this matter may be of small moment, it is of importance that we should know accurately as to its native habitat, and the pupil's reply would be that it came from South America, chiefly from Peru, Chili, and Brazil, where it grows as a wild plant, having somewhat coarse stem and leaf growth, and creates in the ground numerous small tubers that were found to be edible. The importance of knowing of its habitat, a very warm part of the world, is that we in cold Europe have to grow it under conditions such as most assimilate to those of South America. Hence we find it still to be a very tender plant, exceedingly susceptible to harm from frosts, or other climatic troubles, the tubers also being too tender to be exposed to frost during the winter. Down to the beginning of the nineteenth century the Potato seems to have made comparatively little progress. But since that time it has been greatly changed under the influence of intercrossing, of selection and of culture, so that now we have the finest varieties in the whole world, and grow the tubers as articles of vegetable food of importance to the human family second only to wheat.

Propagation.—All growers of the Potato find it is easy enough to make stocks to increase by means of the root tubers so abundantly produced by the plants. Commonly the lesser ones are utilised as seed tubers for planting, the larger ones being eaten. But it is of the first importance that the tubers be for these diverse purposes differently treated. All tubers to be eaten as food when cooked must be kept secluded from light and air in soil pits or clamps made outdoors, but well covered with straw and soil to exclude rain or frost, or they must be kept in cellars or dry sheds well covered up. The object in exclud-

ing light and air is to prevent the tubers from becoming green, as they will be if thus exposed to light, and when so greened be quite unfit for eating. The seed tubers, on the other hand, need to be so kept that, whilst dry and free from frost, yet they have ample light and air, so that the skins by such exposure become hard, and when later in the winter the eyes or buds begin to shoot or burst into growth, such shoots as may be formed will then be stout, strong, and green, and can be retained on the tubers for planting. Were the tubers kept in darkness, the shoot made from the eye would be long, weak, and blanched, and in that way worthless, while their production would rob the tubers of much nutriment, and check the production of strong shoots when planted.

Preserving Seed Tubers.—The best and simplest method of doing this satisfactorily is to have shallow trays or boxes made from thin boards. These may be but 4 inches deep inside, and be of such sizes as may be preferred. Those of 14 inches by 18 inches hold quite a large number of seed tubers, which should be stood in the boxes with their shoot or bud ends upwards, and close together. If a strip of stout wood be fastened to each end of the box to form a handle, great convenience for moving and planting are furnished. These boxes may be stood in quite a cool, airy place during open weather, and be stacked close together and covered up, or removed into a less cold position when frosts threaten. It is difficult to overestimate the value of such treatment meted out to seed tubers, as the

PRODUCE FROM SETS WITH ONLY ONE STRONG SHOOT WHEN PLANTED

SEVERAL STEMS AND SMALL TUBERS DUE TO BAD STORAGE

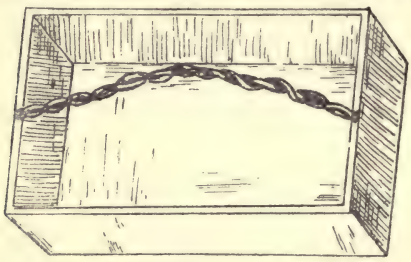
crops from such cared-for sets are usually double in bulk to those that result from badly wintered tubers, especially as bad storing always tends to weaken the stock.

Raising from Seed.—The Potato as grown now, with the object of securing the greatest possible crop of tubers or root produce, seldom produces seed naturally, although the plants will in the summer bloom profusely. The plants seem incapable of carrying at once abundant root tubers and seed balls or apples which contain seed. Those who wish to raise Potatoes from seed must obtain pollen or fine fertile dust from the flowers of one variety, and employ it to fertilise the pistil points of one or two flowers on some other variety, and thus induce the bloom to set, to carry seed, balls or apples. These when ripe can be saved, kept in a box in a dry place for the winter, when only seed and skins will be left. The seeds may then be cleaned, and about the middle of April sown in pans on fine soil, and be stood in a greenhouse or frame to germinate. Later the young plants have to be dibbled thinly into shallow boxes, and from these at the end of May be transplanted into the open ground in rows, 2 feet apart, for the summer.

Planting the Sets.—A fairly light, deep soil suits the Potato well. It need not necessarily be rich with fresh manure; generally it is best to manure well for some previous vegetable crop, and then follow with Potatoes. But the soil should always be deeply worked, and broken quite loose. Very early varieties may be planted on a warm border during March, but some protection from frost must be furnished to the plants. For all ordinary purposes and main crops, it is early enough to plant from the second to

the fourth weeks in April. Moderate growing varieties may be put into rows at 2 feet apart, and strong late growers should be in rows 30 inches apart. A good depth to plant is from 4 to 5 inches. In the rows the sets should be from 12 to 15 inches apart. There is no gain in planting closer, and often much loss in doing so. As to methods of planting, the tubers must be properly buried in the soil from 4 to 5 inches deep without injuring the shoots on them. On light, loose soils a large dibble, shod with iron, answers very well, but generally it is best to plant as the ground is being dug, or, if previously dug, to throw out furrows of the above depth, setting the tubers into them carefully. If any artificial manure be employed, it is a good plan to strew it into the furrows with the tubers.

Moulding the Plants.—This treatment is given to Potatoes for some two or three reasons, but chiefly because were soil not heaped over the tubers many would be exposed to the air, and they would thus become green and unfit for food. A good ridge of soil drawn about the plants also helps to keep the stems erect and protected from harm by strong winds. Prior, however, to the moulding up, the soil should be very freely hoed so as to destroy weeds, and render the surface loose and pulverised. The moulding up is ordinarily done with the long-handled hoe, but the greatest care should be taken not to bury leaves, rather to draw up the soil under them. A good moulding up to a sharp ridge also helps to throw off heavy rains from the tubers, and also those fungus spores which produce the disease. It is often, when the soil is rather poor, good practice to sprinkle from 3 lbs. to 4 lbs. per rod of nitrate of soda or sulphate of ammonia between the rows of plants before the moulding up is performed. When lifting the crop, the medium-sized tubers should be gathered up separately, and be exposed to the light and air to harden them, whilst the larger ones intended for eating should be put into a dry place, and secluded from light and air.



SEED POTATO BOX

The Potato Disease.—This is a trouble our Potato crops are never free from. But they suffer less in warm, dry seasons, and more in wet ones. The disease is a fungus propagated by minute spores that become living and active germs during the summer, and, lodging on the plants, are by moisture induced to root or grow into the leafage and stems, as also in the newly-forming tubers in the soil, and thus produce those black spots with which we have long been made familiar. Only one form of dressing seems so far to have been capable of checking the growth of these spores on the plants, and that is found in what is called the Bordeaux mixture, which consists of equal portions of sulphate of copper, or bluestone, and of fresh lime, dissolved in water. If 5 lbs. of bluestone be put into a bag and suspended in a wooden tub containing 5 gallons of boiling water, it will dissolve in the course of 24 hours, and 5 lbs. of lime dissolved in a large pail holding 5 gallons of water until quite clear. The latter liquid should be mixed with the copper solution, and to the whole add 40 gallons of water. It will be wise to add 5 lbs. of soft soap, well dissolved, to the mixture, to render it more adhesive. This mixture is then sprayed by the aid of a knapsack-distributer over the Potato plants, giving one dressing about the middle of July and a second early in August. Such dressings usually suffice to keep the breadths quite free from harm by the Potato fungus.

Varieties.—These are very numerous, and, because new ones are annually introduced, are constantly varying in popularity.

First Earlies for frame, pot, or border culture: Ashleaf, Ringleader, May Queen, kidneys; Harbinger, Victor, and Laxton's First Crop, rounds.

Earlies for open ground: Puritan, White Beauty of Hebron, Snowdrop, kidneys; Early Regent, Snowball, and Ninetyfold, rounds.

Main Crop Varieties: Up-to-Date, Bruce, Chancellor, and Reading Giant, kidneys; Challenge, Windsor Castle, Syon House Prolific, and Prime Minister, rounds.

These are all whites. A few are well coloured.

Radishes.—These are very varied in character, as they include long, tapering, oval, and round roots, in diverse colours; also for winter use, round and tapering large roots, black, white, and red. Radishes are eaten raw as salading, the most favoured being those oval or round rooted forms that come in early in the spring. Seed of those should be sown thickly on ground that has been heavily manured, the dressing being just buried with soil. The first sowing may be made in February, the rest, following at fortnightly intervals, being small ones. When the seed is sown it should be very lightly covered with

fine soil, then patted down, watered, and covered with long litter or netting to keep off birds. As growth follows, the covering may be removed. It is simply needful to repeat this form of culture all the summer. It is of little use to sow Radish seed in poor ground, as growth is too slow, the roots become hot or hard, and the plants soon bolt off to flower. Water should be given freely in dry weather when sowings are made regularly and often a mere patch of a few yards in area is ample for single sowings. The earliest of all is the Red Globe Short-Top, but there are few better ones than the round and globe-shaped French Breakfast, with their white tips, and these may be followed by the red and white turnip-rooted. Those who like long Radishes may prefer the Long Salmon and Wood's Early Frame, but for these the soil should be deeply worked ; the roots are also a few days longer in coming to maturity. In all cases roots soon become woolly or hollow, hence it is important to sow often. To have winter Radishes of fair size it is well to sow seeds on good ground in June and July, having the plants in drills 12 inches apart, where they can be moderately thinned. The best of these, all excellent when peeled and sliced for winter salads, are the long black, white, and carmine varieties.

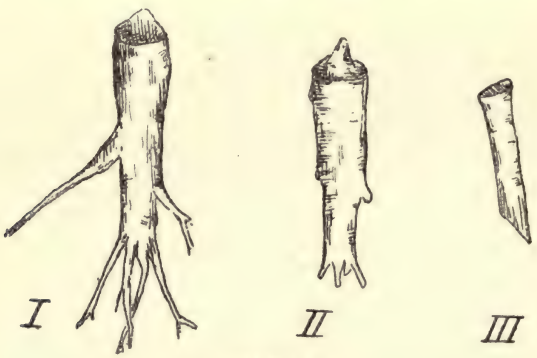
Rhubarb.—A very useful and popular edible stem plant. Rhubarb is easily grown, yet it needs to be grown well. Plants can be raised by sowing seed outdoors in May thinly, in a drill, thinning out the seedlings to 20 inches apart, but especially saving those which seem to be the earliest and strongest as well as that show most colour in the stems. After the leafage has died down in the winter, these roots should be lifted and planted out on to deep, well-manured ground, in rows 4 feet apart, and 3 feet apart in the rows. So treated, they soon become strong, and give plenty of stems.

But seedling Rhubarbs are of several varieties, whilst plants obtained by division are true to name. If, therefore, no roots be at hand, a few can be purchased cheaply from the nursery or seedsman. These will be stout and fleshy, and have one or two crowns. They should be planted as advised for the seedlings, during November or December, and some long litter manure laid about them as a protection from frost, because newly planted. Growth will commence in March, but no stems should be pulled from these plants that year. The following spring they will break up very strong, and many stems may be pulled then up to the middle of May. Then the plants will again make strong growth for the rest of the season, and should be left alone. Winter culture consists in spreading over the ground between the plants a dressing of manure, which may be lightly forked in, and just over the crowns may be put some light litter, as that helps to promote quicker growth in the spring. It is a good plan to put out a few new or small roots each year, as after the third year the roots, then large, may be lifted as wanted, some two or three at a time, beginning in January, and be stood in any warm, dark place, with soil about them and watered, when stems will soon be produced, and thus give very early Rhubarb ; or, if preferred, some roots may be simply covered up out-doors with tubs, boxes, or big pots, and these with long manure or leaves, and thus induced to make early growth for pulling. Once a good stock of roots is obtained, a few should be lifted and divided every year for planting as advised. Roots should never remain more than four years, if they do well, without being divided. The best varieties are Hawke's Champagne, early ; Paragon and Victoria, the latter for later use.

Small Salads.—Of these the best and most commonly grown are Mustard and Cress. Market growers use Rape instead of Mustard as it is less hot and far cheaper. In a small way the best method of growing these salads is to have several boxes, each about 12 inches by 20 inches, and 3 inches deep. They should be filled with good loam and well-decayed manure, and have on the surface a thin top of fine sandy soil well pressed down, and within the third of an inch of the top of the box. On to that the seeds of Mustard and of Cress, in separate boxes, may be thickly sown, pressed down, and well watered, then covered up with newspapers and stood in a frame or greenhouse. The Cress being of slower growth should be sown 24 hours before the Mustard. It is important that the boxes be covered, the plant-growth lifting up the paper bodily, as that causes rapid development, and the salading is more tender. A couple of fresh boxes should be sown, and similarly treated each week, all through the spring and summer. If sown outdoors it should be under hand-lights, as otherwise growth is slow and hard. Another valuable small salad is Watercress, which is, of course, best grown in small streams, but may be had very good all the same in any small garden if a bed be made near a pump-tap or well, where watering twice a day can be given. The bed should be prepared in March by forking into quite a small space, say 3 feet by 4 feet, a good dressing of short manure. Strew over the surface some sharp sand and a little shingle or well-washed small gravel, then dibble in, 4 inches apart, Cress tops partially rooted, water them, and shade with paper or other thin material for a few days. Rooting soon follows, then growth, and if the bed be watered in dry weather twice a day, considerable gatherings may be had over a long season. A ridge of soil a few inches in height may be placed round the bed. Watercress can also be raised by sowing seed in a pan under glass, then dibbling the plants out as advised into a bed when strong enough.

Salsafy and Scorzonera.—These are long tapering-rooted plants that do not obtain the wide cultivation they deserve. The Salsafy has long, narrow leafage, and long, narrow, white roots. Scorzonera has broader leaves and dark-skinned roots. The former enjoys on the Continent the designation of vegetable oyster, so nice are the roots when properly cooked. Seed of both plants should be sown about the middle of April in shallow drills, 12 inches apart, and on soil that has been deeply dug. When the weather is dry it is well to thoroughly water the drills an hour before sowing the seeds. The plants when 4 inches in height need to be thinned out to from 3 to 4 inches apart in the rows. The hoe should be freely used between them during the summer. Roots of both kinds are cooked and sent to table. They can be used from October onwards during the winter, but the roots should have some protection in hard weather.

Seakale.—This is a hardy British plant. Seakale, as its name implies, is partial to the sea coast. But it thrives well in any ordinary garden soil, provided that be well prepared for it. To obtain a supply or stock of roots, it is needful to sow seed. That can be purchased cheaply. For its reception, ground should be trenched 2 feet deep and well manured. Then, early in April, drills, 2 inches in depth, should be drawn with hoe and line at 20 inches apart. Along these the seeds should be sown thinly, and then covered up. It is not desirable, as the seed leaves are rather tender, that the plants should be above ground until the middle of May. When all are up they should be rigidly thinned out in the rows to 10 inches apart, as later on they need ample room. The



SEAKALE

1. Untrimmed root. 2. Trimmed for forcing. 3. Root cutting for planting.

ground needs to be kept well hoed as long as the strong leafage which will presently form will allow, but later that will quite cover the ground. In the late autumn, being mature, it will die away. In November the whole of the roots may be carefully lifted so as to preserve them intact, then each one must be hard trimmed of all branching or side roots cut off close to the main or tap root, which, when thus trimmed, should be about 8 inches long, and have a dormant crown at the tip. When trimming off all side roots the pieces should be carefully laid one way, so that the upper ends be known. But the first thing next to do is to chop down in the open ground with a spade a trench or furrow, 8 inches deep, and nearly upright. Into this the crowns should be placed on end upwards, quite close together, and some soil put up to them and gently trodden, as well as a little over the crowns. All these roots may be, a few at a time, through the winter put into boxes or tubs, or on the floor of a close, dark cellar, or in any warm but quite dark place, in several inches of soil, and well watered, and from each crown will come stems, that being in the dark will be blanched white and tender, and when 7 inches long may be cut with a part of the crowns and cooked. It is then a most delicious vegetable, and lasts, if there be plenty of roots, for some three or four months. All the side roots trimmed off should then be made into proper root cuttings. These should be from 4 to 5 inches long. The top part should be quite level, and the lower part slanting. Then all these root cuttings should be stood into trenches just deep enough to bury the tops when being placed thickly; soil is put against them and a little over them. Let that be done in November. Planting may be done at the end of March or early in April. For the reception of these cuttings the ground should be well trenched

and manured, as is so constantly advised. The cuttings should be dibbled into it in rows 20 inches apart, and 12 inches apart in the rows, to give ample room. The tops of the cuttings should be buried half an inch in the ground. When, in a few weeks, leaves appear, each root should be gone over, and all but one crown removed. The ground must be well hoed, and one dressing of salt or nitrate, at the rate of 5 lbs. per rod, well hoed in, will do great good. The roots will have to be lifted and treated each winter just as advised for the seedlings, and trimmed, root cuttings being preserved and again planted in fresh soil. In that way it is easy to have hundreds of roots to blanch during the winter, and no vegetable is more profitable. To have some late blanched growths, some of the rows, if only one or two, may be left in the ground, and early in March have some light, loose soil placed over them in a ridge, and 9 inches deep. When the ground shows signs of cracking, rows should be cut from at one end until all are consumed. These roots may remain to produce crowns if desired for the following winter.

Shallots are small, fairly hardy bulbs, members of the Onion tribe, that are grown yearly by the aid of small bulbs or offsets, planted in beds or in rows, 12 inches apart, in February. The ground for these bulbs should be deeply dug, and moderately manured. Planting may be done in the autumn, but early in February is the safest time to do so. If planted in a bed, let the rows be 12 inches apart, putting in the bulbs at 6 inches apart. These should not be of the largest or smallest, but those of medium size and good form. It is but needful to press each bulb down firmly into the soil, so that its top is just covered. Growth soon begins. Several stems usually grow, and each one forms a bulb at the base, so that when the tops die down and the bulbs are ripe, ready to lift in July, they are in the form of clusters of some seven to nine in number. If, after planting, sharp frosts come, it may be wise after they have disappeared to make the soil about the roots somewhat firm. Not large, but nice, clean, even-sized bulbs are best. They are appreciated for pickling, and for soups and stews. The best variety is the Old Shallot, which has a brown, silky skin; and the largest is the Red Jersey or Russian, which is double the size and very productive, but is of stronger flavour.

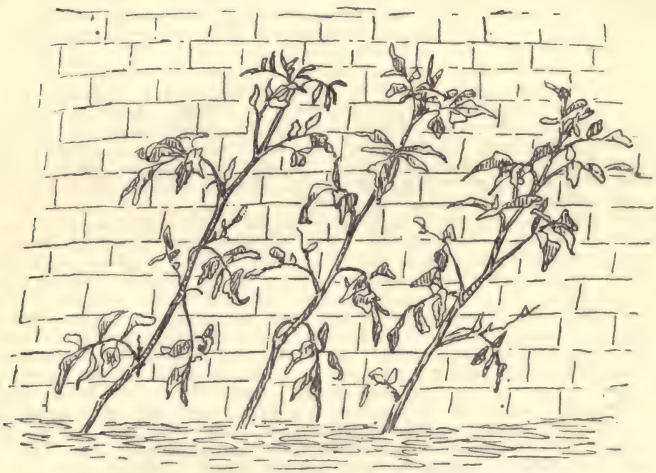
Spinach.—This is a very useful, hardy, green-leaved vegetable that is easily raised from seed, and can be had over a long season. Its nature when gathered and cooked is somewhat bitter or astringent, but when properly prepared and sent to table with condiments that bitterness is toned down and becomes rather pleasant. Spinach is a very healthy product, and should be more largely consumed than is usually the case. Seed is both smooth and prickly, but all varieties have those characteristics. It is customary to recommend sowing round or smooth seed in the summer and prickly seed in the autumn for a winter stock, but that is a mere seed fancy. Without doubt the best varieties are for summer the Long Stander, which has large, thick, green leaves, and if well thinned out to 9 inches apart in the rows, stands much longer before running off to flower than any other. That and the Victoria or Viroflay, very large leaved, are the best for winter cropping. The drills should be fully 12 inches apart, drawn shallow, and the seed be sown thinly. Spinach needs good liberally manured and deeply dug soil. The earliest sowing may be made on a warm border about the middle of March, and others for succession every three or four weeks, not large ones, but to give a good succession. The final sowing should be made about the third week in August, as that will begin giving leaves in November and form the supply all the winter till quite the end of March. In all cases leaves only should be gathered, but not until the plants have become strong. Besides thinning the plants, the hoe should be freely used between the rows in all seasons, not only to destroy weeds, but also to keep the soil open and loose.

Tomatoes.—These plants are, like Potatoes, very tender, and so closely allied to them that it has been found possible to graft Tomatoes on to Potato stems, and thus exhibit the strange phenomenon of Potato tubers in the ground on the roots and Tomatoes above the ground on the stems. But the Tomato is a Lycopersicum and not a Solanum. They are, however, tender, and can be grown outdoors only during the summer months, but may be grown at any time in glasshouses when a sufficient warmth is produced. Still it is never wise to attempt to fruit the plants in glasshouses during midwinter, for, because of the lack of sunshine, the fruits are few and quite flavourless. All the plants are easily raised from seed, as each fruit produces seeds in abundance. These, where any are saved specially for one's own growing, may easily be taken from the fruits by cutting them clean through crosswise, removing the seeds from the cells with a knife, washing and drying them, then saving in a paper bag until wanted to sow. In saving fruits for seed always select one of the finest and handsomest from a plant that fruits well, as in that way a good stock is obtained. Where it is desired to keep any stock true, only that one variety should be grown in one house.

Sowing Seed.—Generally it is best to make sowings in pots of from 5 to 6 inches across the tops, putting an inch depth of broken crocks or rubble into the bottoms, on to that some of the coarser soil used, then filling up with a compost of loam, leaf-soil, and

sharp sand. Press the soil into the pots fairly firm, and leave it the third of an inch below the tops of the rims. Sow the seeds evenly and singly over the soil, putting about fifteen seeds into a 5-inch pot and twenty-four into a 6-inch pot. Then place over them fine soil the thickness of a penny piece, water gently, and stand in a frame or greenhouse. Until the seeds make growth it is well to place a sheet of thin paper over the pots to shade them if the sunshine be strong. But whilst seed sown thus in April or May will germinate—that is, grow very well without the aid of artificial warmth—if sowings be made earlier some such warmth is needful, as growth will be slow and very weak. But it is seldom necessary to sow seeds before the middle of April, and then the sun usually warms a frame or greenhouse sufficiently. Even then if the pots be stood in a box large enough to hold four of them and a sheet of glass laid over the box, great help is given to the seeds. Where there is no glasshouse plants may be raised in such a box thus covered with glass, if stood in a sunny place in a garden. Of course, some covering should be given to it at night.

General Treatment.—When seedling plants are some 2 inches in height and show what are called rough or second leaves, it will be needful to lift them carefully with the aid of a



TOMATO PLANTS TRAINED OBLIQUELY TO WALL.

Planted 18 inches apart. Slight bending of the plants usually promotes earlier fruiting.

pointed stick from the seed pots, and put them singly into quite small or 3-inch pots, still using sharp sandy soil, and giving each pot some drainage. In thus potting the seedlings place them down so as to bury one-half of their stems. When all are done, water gently, then stand them, whether in a frame, or greenhouse, or in a glass-covered box, as close to the glass as possible. Water should be given sparingly, as the little plants are apt to damp off if over watered. In three weeks it should be needful to shift the plants into 5-inch pots, still keeping the stems down a little into the fresh soil as roots break from them. After being in these pots for a fortnight, and under glass, the plants should be ready to plant out in a greenhouse, or to be put into large pots or boxes for similar growth, or be planted outdoors into a warm position.

House or Frame Culture.—The common method of growing Tomatoes under glass by amateurs is in large pots. The method is one of the best generally, as the roots are kept under control. Pots for this purpose should be 10 inches across the top. A few rough pieces of potsherd should be placed in the bottom, on that some coarse pieces of turfy loam, and then filled with a compost of turfy loam, old hot-bed, mushroom-bed, or well-decayed stable droppings, in the proportion of one-fourth to three parts of loam. A little wood ash may be added, as also a pint of bone-meal to a bushel of the whole compost, and well mixed. As the pots are filled the soil should be pressed

into them firmly, then the plants from the 5-inch pots set into the centres, and keep the stems still somewhat down. Then the pots should be placed close together in a row where the plants are to be grown, the stems then being about 12 inches apart. Generally it is best to raise the pots on a stout shelf or plank to within 20 inches of the roof, if to be so trained, then tying the stems loosely but securely as they grow to wires, fixed some 10 inches from the roof. As growth ensues all side shoots which break out from the base of every leaf must be hard pinched off. Flower trusses break out from the main stem, and so long as the plants are kept watered and have occasional soakings of liquid manure, after fruits are well set, and also warmth is kept up, the plants will go on fruiting if kept for that purpose until nearly the end of November. Where pots are not to be had boxes 20 inches long and 9 inches wide and deep will carry two plants very well. In the case of market growers, Tomatoes are generally planted out on the house floors, and trained up erect ; but that is not a method to advise for beginners or those who have but small houses, as for them nothing excels pot or box culture. Where a house or frame is not provided with fixed wires it is easy to fix strips of wood, or thin stakes, or bamboo

TOMATOES ON A WARM NORTH BORDER IN THE OPEN

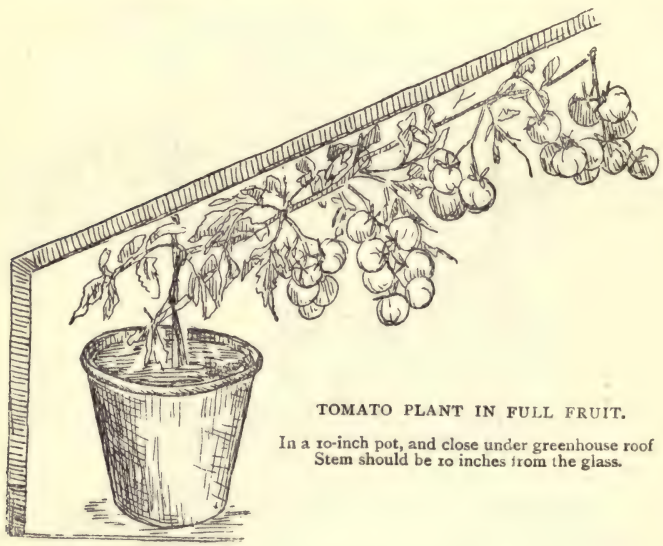
Planted in rows 3 feet apart, 18 inches apart in the rows. Side shoots have been pinched out. Stakes 4 feet long.

rods in a slanting direction, and running just under the glass roof. The plants always fruit more freely when trained in this way than when trained upright. Besides keeping the side shoots pinched off, it is only needful to secure the stems (not too tightly), as they will swell later, to the supports with raffia, grass, or some other soft material, and pinch out the points or leaders of the plants when they reach the full length of their supports.

Setting the Flowers.—Very often amateur growers find it difficult to induce the flowers to set fruit at the first. Sometimes giving the stems of the bunches a gentle tapping two or three times a day helps to that end. Other growers hold a piece of white paper under the flowers, on to which by a vigorous shaking some of the pollen will fall, then take it up on a camel's-hair brush and touch the points of the pistils or the little points which project from out of the centre of the flowers. Tomatoes in houses or frames like plenty of light and air, which is better rather dry than wet. There is no need to use the syringe, and in watering it is not well to leave puddles or slops about, as such over-damping does harm. Even in watering it is better to keep the soil a little too dry than too wet. Too liberal waterings, especially when the fruits are ripening, greatly tend to cracking of the skins, and that is an evil, as mildew soon settles in the cracks and injures the fruits.

Outdoor Culture.—Plants should not be put into any position outdoors earlier than

the middle of May, and even then should have some protection from rough winds and night frosts until the end of the month. When planted against a warm, sunny wall or fence it is easy to furnish the desired protection by hanging sacks, mats, or some other material over them at night. When plants are put on to a border, or in the open garden, the last few days of the month of May are soon enough. If planted against a wall or fence, the ordinary garden soil is sufficiently good as a rule, but if poor a little well-decayed manure may be first dug in, the soil being made fairly firm. Then the plants turned out of their pots may be planted 12 inches apart close to the wall. If they be rather tall it is well to secure them by putting a cloth shred round each stem, which can be secured to the wall with a nail. But plants properly grown should not be tall or drawn, but be stout, sturdy, and well leaved. Of course, nailing becomes essential as the plants grow in height. In the case of those put into the open ground the rows should be 2½ feet apart, and the plants 15 inches apart in the rows. It is a very good plan to drive in a stout stake that will stand 3½ feet out of the ground, just where each plant is to be put. Thus a proper support is ready when needed. It is not desirable to allow open-air Tomatoes to grow higher than some 3½ feet, as beyond that height fruits will not ripen. Keep the side shoots of outdoor Tomatoes pinched as in the case of those under



TOMATO PLANT IN FULL FRUIT.

In a 10-inch pot, and close under greenhouse roof
Stem should be 10 inches from the glass.

glass. In very hot dry weather water occasionally, and place about over the soil a good mulch of long manure, as that serves to retain moisture and checks drying.

Varieties of Tomatoes.—There is an endless number of varieties. There are smooth round and egg-shaped, both red and yellow. There are large and quite small fruited, as well as some of medium size. Some carry great clusters, some are nice to eat raw as table fruits, some to eat as salad, and some when cooked. The most popular ones are those which produce good-sized, round, handsome red fruits, and in great profusion. Good ones of this type are: Perfection, Comet, Delegate, and Duke of York. Good egg or plum-shaped fruits are: A1, Regina, Challenger, and Peerless. There are some of a reddish, terra-cotta colour, but these are not in favour. The best yellow varieties bearing good showy fruits are: Golden Queen, Blenheim Orange, and Sunbeam. The best small-fruited or dessert yellow is Golden Nugget, one of great excellence, the fruit the size of damsons, rich colour and excellent flavour. The best reds are: Red Dessert and Cluster, both wonderfully productive, the fruit being about the size of pigeons' eggs.

Early Winter Crops.—When plants are raised from seed about the middle of June, and are grown on into large pots, as previously described, they are kept outdoors till the end of August. These are put into a greenhouse, near the glass and without heat, till the end of September. Good quantities of fruit will be produced, and if then warmth of from

60 to 70 degrees of heat be furnished, all these plants will ripen fruits well up to the end of the year, and at a season when Tomatoes are scarce.

Turnips.—These root vegetables can be had in gardens for a long season. A common fault is to sow seed too thickly and largely at once during the spring and summer. Frequent but quite small sowings of but a few yards in extent are usually ample, if made once in three weeks from March till the middle of August, when others of more extensive breadth should be made, as those will have to furnish a supply for the winter months. It is a common rule in good gardens to make up a bed of manure and leaves to furnish warmth; on that to place a wood frame, to half fill it with soil, then to sow seed in drills 9 inches apart, to water, and place a glass light over, covering up with mats to preserve the heat. The seeds germinate in a few days. Light must then be given, except at night, when covering up is needful. The plants need to be thinned to about two inches apart. The best varieties for this purpose are the Long Forcing, or tap-rooted, much like a long, white radish, but a capital table variety and keeping fresh a long time; and the round-rooted Early Milan. The former is, however, the best. Then successive sowings of either of these varieties should be made in April and succeeding months, in drills 12 inches apart and thinly. Large bulbs are not required, but the soil should be rich and kept well watered in dry weather, as quick growth is needful to secure crisp, fresh, sweet roots. Very moderate thinning of the plants whilst small suffices. In August two sowings, one early, one in the third week, may be made of that excellent variety Snowball, a very white, round form. The sowings are best made in drills 12 inches apart, the plants being thinned down to 4 inches apart. Sowing in drills facilitates thinning and hoeing, and also saves waste in sowing seed. A free use of the hoe between the plants whilst quite young keeps down weeds, and helps the plants to make good growth. From these August sowings of the Snowball, bulbs may be pulled of the best table quality up to the end of the year, and if the weather be not severe then much later. For late winter pulling it is wise to make, about the 20th of August, where ground is available, a sowing of Red Globe, as that is hardier than the Snowball, and takes longer to produce bulbs. These will need to be thinned out to 6 inches apart, as the leafage must have ample space. If some of the larger bulbs be pulled, trimmed, and stored in sand in a cool shed in January they will be safe from hard frost and give a supply for several weeks. A capital Turnip, very popular in Scotland, and of marrowy texture, is Golden Ball, the flesh quite yellow. This needs similar treatment to the Snowball.

Swedish Turnips.—These are of a distinct race, and are consumed generally by cattle, but small bulbs, such as may easily be grown in gardens, make very nice food in the winter if properly cooked. Seed should be sown in drills 12 inches apart at the end of May or early in June. The seedling plants require to be thinned out to 9 inches apart, and kept free from weeds, and well hoed through the summer. The roots are fairly hardy, and may be left in the ground until January, then be pulled, trimmed, and stored in sand for use as needed. The flesh is soft and pleasant eating. Unused roots of these, or white Turnips, planted outdoors during March, will soon make growth, and furnish tender sprouts or tops that make a pleasant green dish. Swede Turnips well repay growing for this purpose only.

Vegetable Marrows.—Although the Gourd family is a large one, and contains many members that produce handsome ornamental fruits, yet relatively few are worth growing for edible purposes, the forms known as Vegetable Marrows being the best. Vegetable Marrows include fruits long, narrow, and white, or green in colour; others of medium length, of short or almost round form, and of the custard type, those of quaint shape like a little round pie turned out from a basin. All however have, when cooked, flesh of somewhat similar character, soft, succulent, watery, but yet very pleasant eating. Plants differ in habit of growth slightly, or so far that whilst the majority trail in growth, sending out long shoots, a few are of compact or bushy form, and are known as Bush Marrows. These may be planted more closely than others, indeed each may be but three feet apart. The trailing forms are, however, the best, being more varied and productive. They need ample room to run, and seem to be most at home when trained over stiff hedges, sticks, sheds, wood piles, or anything that keeps them from the ground. Of course the plants must be rooted in the soil, and he ground should in all cases be deeply worked, well manured, and be somewhat raised, as the plants like to be on small mounds. Still they thrive well in hot, dry weather when liberally watered, provided they be not deluged too near the stems. Those plants which make long, strong growths need occasional pinching to cause the formation of other shoots which are more productive. Fruits of medium size are best for cooking; those left to produce seed should be very few and be of July blooming. As Vegetable Marrows are very tender, it is unwise to expose them outdoors until danger from late frosts is over. For that reason early in April is soon enough to sow the seed in broad pots or pans, under glass. The seeds should be an inch apart at least, and be buried half an inch. If a little artificial heat can be given in a greenhouse or frame, growth is quicker. Still at that time of the spring sun warmth

is usually strong enough to produce very good growth, if more slowly. When the seedling plants show one or two rough or new leaves, they should be carefully taken from the seed pans, and be put singly into small pots or in pairs, one on each side, into 5-inch pots, using some light good soil. After watering the plants should be placed in ample light, where for a couple of weeks they will become strong. After that they may be placed in a cool frame to harden, and then be stood outdoors in a sheltered place to more fully harden before planting out. That may be done during the last week of May, except where the position is very warm and night protection can be given, when they may go out a week earlier.

Sites for the plants should always be sheltered from strong east or north winds. Holes to receive pairs of plants should be opened 4 to 5 feet apart each way, 2 feet across, and 1 foot in depth. Into the bottom soil some manure should be forked, then other well-decayed manure added to the thrown out soil as filled in, and thus a fair-sized mound is formed, into the centre of which the plants should be put. If it be needful to furnish some protection at night because of danger from frosts, hand-lights are best. Failing these, boxes or large pots, or even baskets, over which a mat or sack or piece of canvas is thrown, are good protectors. These may be put on late in the evening and be removed next morning. But danger at that time of the year is shortlived. A few pairs of plants, thus put out, will produce a great crop of fruits during the year.

Good Varieties are : Long White, Long Green, Pen-y-Byd, Moore's Cream, and Hibbard Prolific, short and roundish, and the quaint-shaped Custard Marrow, but which is not the most profitable. For exhibition Long White is best.

Autumn Protection.—A common danger to Vegetable Marrows arises from unduly early frosts in the autumn. Not infrequently it happens that a sharp frost in September kills the plants, or otherwise they might go on fruiting for some three or four weeks longer. It is good practice with the approach of the 20th of September to draw the plants more closely together, and to lay mats or other light covering over them at night, but removing it early in the morning. With so much care taken plants will often give far more fruit late than is needed to pay for the small trouble involved.

Herbs.—These are indispensable in a vegetable garden. Parsley, always much used for garnishing, will give an ample supply if a row in a shallow drill be sown each year in May, the plants being thinned out to 6 inches apart. Mint may be propagated by putting tops in as cuttings under hand-lights, or in pots in a frame, in May ; also by lifting the long, string-like roots in winter and planting some afresh in other soil. Sage is easily increased by cutting branches from old plants and setting them deep in the ground in May. Both Lemon and Common Thymes can be raised from seed, or be lifted, pulled to pieces, and replanted, and thus increase stock. Both Marjoram and Savory can be increased by seed sowing and division of old plants. Fennel is easily raised from seed. These are the most useful Herbs.

A SUBURBAN FLOWER GARDEN (EALING).

TOWN GARDENING

GARDENING in towns and their neighbourhood is hampered by conditions which the dweller in the pure country air knows nothing of, but gardening may be pursued with pleasure even in the suburbs of London and the great towns of the midlands, where many a mechanic grows his special favourites with consummate skill, sufficiently so to make even his country friends envious of his well-deserved success. Success depends of course upon individual effort. The man who will not try cannot succeed. He bewails his lot amidst smoke and dirt, raves against (and with reason) the domestic cat, and even levels abuse at the tiny heads of the chirping sparrows. But with reasonable attention to details and a proper choice of subjects the town garden should be gay with blossom for many months.

One cannot remedy the impure air, although the atmosphere of a large town or its surroundings is not so disastrous to plant growth as many imagine. The atmosphere is frequently blamed when the cultivator is really at fault, in not trenching the soil well, and in filling the garden with hungry rooting shrubs bent upon extracting every ounce of goodness from beds and borders. Perhaps a description of a garden in which flowers, and even fruits and vegetables, have been successfully grown, may give fresh courage to those who have hitherto reaped nothing but failure. Mr. Woodall, a well-known gardener, who "gardens" for his own pleasure, writes: "Few things are more depressing to the average man than the dismal aspect of a neglected back-garden in a town of considerable size. Such a plot came under my notice not long ago, and, under judicious and careful arrangement, it has in a very short time proved such a pleasure that I think some details may be of use to those who find themselves possessors of such a potential 'Eden.' As is usually the case in all ordinary town gardens, the area is about three times as long as it is wide—in this case containing quite a third of an acre—surrounded by sooty brick walls devoid of any climber whatever. The ground is quite flat and the soil strong clay, which, however, had once been well worked.

On the ground stand two dilapidated and dark old glass-houses; one a vinery facing south with a somewhat raised Vine border long disused; the other house, a span roof, near the eastern wall of the garden. A few poor trees outside at one corner give the only touch of greenness to the space within.

"The first idea, to cut up the ground into three squares, one for flowers, one for vegetables, and one for reserve ground, was abandoned, both on account of its ugliness and also because it did not afford scope for a grass walk with flowers at each side and a seat in shelter, which was the cherished wish of the new possessor. At last it was decided to make a broad gravel walk across the width of the garden at the far end, and heighten the old Vine border so as to obtain a southern slope. The entrance to the garden is at the south-west corner, and the greenhouse stands midway on the eastern side, projecting into the ground. This afforded an opportunity to destroy the formality of the long strip by making a broad grass walk from the entrance diagonally across the ground into the angle between the greenhouse and the garden wall. This walk, seven feet broad, was sunk quite three feet into the ground by the steps at the entrance, and rose gradually to the ground-level at the other end. The clay and soil taken out were used to raise the beds on either side and make an even slope to the path as it rose to the level. At a distance of about twelve feet from the grass path a hedge of *Olearia Haastii* and red and white double Japanese *Rosa rugosa* was planted to screen off the reserve and vegetable plots from the decorative part of the garden. By this means two broad borders were obtained having different aspects, and at the upper end a very warm and sheltered corner was formed for tender plants, while at the lower end by the door two fair-sized triangles were dug out of the clay to form a drainage to the sloping walk, and at the same time afford a moist and shady nook where some hardier bog plants and flowers might thrive.

"Towards the upper end a narrow gravel path was cut through the bank round the end of the greenhouse which joined the broad terrace walk at the foot of the Vine border, and afforded on the side near the greenhouse a suitable place for a seat where the flower borders might be seen. Four Bay trees in tubs (which find shelter in winter in the disused vinery) protect the seat from the neighbours by means of striped awnings tied from stem to stem.

"After this rough blocking out of the flower garden the next thing was to plant it, and to harden one's heart against unsuitable things, however lovely and desirable they might be in

themselves. I am not sure that in the long run there is not some advantage in being unable to grow many things, as the best effects are always attained by simple means.

"Roses are forbidden in a town garden except the invaluable *Rosa rugosa* and its varieties, but the new and extra vigorous *R. wichuriana*, which is not well known as yet, seems to promise great things. Its corymbs of sweet white little flowers in August and September are most delightful, and its glossy neat foliage an ornament to any garden. Conifers, too, are quite useless, and so is any evergreen that is sooty and black like some of the varieties of the Holly.

"On the other hand, Carnations and Pinks thrive extremely well, so broad masses of them adorn this walk, and a bed of seedlings in the reserve plot affords a long succession. Yuccas, Tritonias, Lilies, and tall Composites form a stately background to the usual semi-hardy bedding plants and annuals, and Sweet Peas, Mignonette, and Sweet Geraniums afford, with Coreopsis and various Composites, plenty of bloom for cutting, even though their fragrance may not equal that of those grown in country air. Irises of all sorts, and especially Gladioli, are as happy as possible, and Dahlias are bright and useful till the sun gets hidden behind the tall houses near, and causes an early collapse in autumn.

"The walls of a town garden are always a trouble. In this instance they were so dismally sooty and black that the only thing to do was to whitewash them all; and a precious business it was to obtain anything like a clean surface! But no sooner was it done than the way the plants responded to the increased light and lessened dry baking heat in the summer was wonderful, and proved it was the right thing. Trifles can make or mar, and I am inclined to think this trifle made a great deal of the success in this town garden.

"There is one decided advantage in a town garden, and that is the greater freedom from frost, so that many shrubs will live there that would perish in frostier situations. So the walls where the sun lingered longest were planted with Choisyas, Laurustinus, Jasmines, variegated Euonymus, Escallonias, and many another flowering shrub and climber, including Clematises in variety, and they are all doing well and looking as they should do—ornamental.

"The plague of caterpillars so common in town gardens in the early autumn does not affect any of these. On the shady sides, the simple plan of planting tall Oval-leaved Privet and sowing climbing Nasturtiums to climb over and between was, of course, adopted, and Aucubas, Aralia Sieboldi, Megasea, and Funkias formed handsome masses of solid foliage, till in

two years' time this garden has become as full of interest and beauty as it was desolate and barren before, and a wonder to those whose knowledge was not equal to their love."

Much that is written in this work applies with equal force to the town garden as well as the garden in the country, especially with regard to the greenhouse and its management, window-boxes, and plants in rooms.

Absence of Light and Tree Planting.—One of the great drawbacks to town gardening is the absence of light. Suburban and town streets are frequently over-planted with trees, which cast their shadows over road and pavement, create damp pathways, and shut all sun and air from the dwelling itself—precious life-giving agents, without which no home is wholesome. Never shut out the sunshine by erecting a large greenhouse or by planting trees in such a way as to throw shadows into the living rooms. Frequently Horse Chestnuts, Limes, Planes, and, in truth, forest trees are planted close to a small house. The garden, perhaps, is lined with Poplars, or things as vigorous and tall in growth, with the result that the soil of the garden is full of hungry roots, plants refuse to behave respectably, and the house itself is dark and unhealthy. Nothing of tall growth should be planted near the suburban house, and there is no reason why things fit only for the forest should enter the forecourt of a suburban residence, and we have in mind now small houses and gardens, not even those in which space is provided for a tennis court or spacious lawn. Under these conditions Quinces, masses of Lavender and Rosemary, Siberian Crabs, Medlars, Thorns, and any of the beautiful deciduous flowering things of comparatively moderate stature recorded in our chapter upon Trees and Shrubs, the Almond, Rose Acacia, Catalpa (even this is too large as a rule), the Silver Birch, where it will succeed, *Paulownia imperialis*, Guelder Rose, Laburnum, Fig, *Ailantus glandulosa*, Flowering Currants, *Ribes sanguinea* and its varieties, especially *atrosanguinea*, the flowers of which are deep crimson ; the Pyruses, not forgetting the delightful dwarf growing *Pyrus Malus floribunda*, one of the most charming dwarf shrubs in existence ; *Daphne Mezereum* or the Mezereon, and the varieties of Weigela (Diervilla), one of the best of which is Eva Rathke.

The Weigelas are amongst the best of town shrubs. The writer has seen the crimson-flowered variety Eva Rathke quite happy even in a Chelsea garden, where against a southern fence the shrub blossoms with great freedom until the late autumn. *Euonymus japonicus* and its varieties, all evergreen, are useful, and also of note are the Aucuba, Lilacs, the Sumach (Rhus), *Arbutus Unedo* (the Strawberry Tree), unless the garden

LAWN WITH FLOWER BORDERS IN AN EALING GARDEN.

is very exposed; Rhododendrons, Laurustinus (in warm, sheltered gardens it is not very hardy), *Cotoneaster frigida*, *C. Simonsi*, the sprawling deep green-leaved evergreen *C. microphylla*, the Wistaria, and the familiar Maple and its variegated variety (*Ager Negundo variegata*). Hollies, Magnolias, common Barberry (*Berberis vulgaris*), especially the early-flowering *M. conspicua* (Yulan) are a success. We have also seen very healthy Yews, but as a rule anything of this nature and Conifers are a complete failure, soil or fogs clogging up the shoots and producing suffocation. One of the most frequently planted things is the Fiery Thorn (*Cratægus Pyracantha*), conspicuous for its bunches of creamy white flowers in summer and its crimson fruits throughout the autumn and winter. This should never, however, be placed against red-bricked houses; the effect is distressing to those who pride themselves upon an appreciation of beautiful colour association.

The aim of the town gardener should be to get away from the eternal repetition of a few things. There is joy in variety. Privet is repeated with sickening regularity; the suburbs smell of Privet, and a dead sense of colouring oppresses every one who knows how bright and gladsome is the garden planted with things that bring beauty to it through their flowers, foliage, or ruddy fruits in winter. Get out of the well-beaten tracks. Seek further afield than the local nurserymen, and revel amongst the Thorns, the Lilacs, the Magnolias, and many other beautiful families of trees and shrubs—things that will give a new beauty to the town garden.

It is unnecessary to describe in this chapter how trees and shrubs should be planted. The advice already given about planting in general applies in this case, but the

Soil will probably need more stirring up in the town garden than in the country. Read carefully the remarks about trenching, manures, and so forth, and carry them fully into practice. A town garden when presented to the owner fresh from the builder's hands is frequently a sorry affair. The soil has been denuded of its precious gravel, if it possessed any, and is filled with brickbats and refuse of a miscellaneous character that must be removed in the interests of the flowers that are to follow in due season. It is labour well spent to make a sure foundation. Trench the soil thoroughly, and if poor, bring in plenty of loam and road scrapings, and follow remarks already given as to how to treat the various kinds of garden ground.

The majority of gardens are rectangular, they follow the lines of the house; and usually a border at the sides and grass in the middle suffice, without any needless cutting up of the

middle into small, patchy beds. Keep away all shrubs, especially such things as Elder, from the borders. It is not always possible to do this, but unless the roots of trees and shrubs are kept out of the soil where perennials are to go, endless attention in the way of mulching and manuring will be needful during the late spring and summer.

Hardy Perennials.—The sheet anchor of the beginner in gardening is the hardy perennial, which requires no lifting in the winter to shelter it from the frost, and comes up again each season to again give pleasure to the possessor. The writer has had considerable experience with town gardens, and can place faith in border Auriculas, sweet-scented, finely-coloured flowers, so gay and green that even a strong tuft will almost flower itself to death; and again it may be mentioned that everything referred to here is alluded to in some part of the present book, so that a detailed description is needless here. Campanulas, or Canterbury Bells, in rich variety of form and colour; Creeping Jenny (*Lysimachia nummularia*), Day Lilies (Hemerocallis) for shady places, *Dielytra spectabilis*, Larkspurs, or Perennial Delphiniums, Evening Primrose (*Œnothera biennis*), and some of the other Œnotheras, such as *Œ. fruticosa* and the rich orange-flowered *Fraseri;* Everlasting Peas, Spiderwort (Tradescantia), Phloxes of good colours, London Pride, *Papaver umbrosum*, delightful for edgings; Michaelmas Daisies, Oriental Poppy (*Papaver orientale*, and its variety *bracteatum*), Primroses, Polyanthuses, Snapdragons, Wallflowers, Sweet Williams, double and single Pyrethrums, Thrift, Solomon's Seal, *Anemone japonica* and its beautiful white variety *alba*, also known as Honorine Joubert; *Arabis albida* (White Rock Cress), *Alyssum saxatile* (Rock Madwort), with rich yellow flowers; Aquilegia hybrids, particularly the beautiful spurred varieties; Aubrietias, dwarf plants for edging the border, or forming groups near the front; *Cerastium tomentosum* (silvery foliage), Carnations, Pinks, Doronicums, early-flowering perennials with large, handsome yellow flowers—*D. plantagineum excelsum* is the finest; *Gypsophila paniculata*, wavy masses of flowers; German Iris, Lupines, Golden Rods (Solidago), Forget-me-nots, Crimson Pæony, many kinds of Saxifrage, especially *Saxifraga hypnoides*, and the large leathery-leaved Megaseas, Stonecrops, Sempervivums, Tufted Pansies, Monkshood (*Aconitum Napellus*), *Campanula glomerata dahurica* (with deep purple flowers); *C. persicifolia*, early-flowering Chrysanthemums, *Coreopsis grandiflora, Helenium autumnale, Erigeron speciosus superbus;* the perennial Sunflowers (Helianthus)—the last-mentioned are quite happy, sending up a wealth of golden flowers through-

THE WHITE JAPANESE WINDFLOWER (ANEMONE JAPONICA ALBA).

out the autumn months; *Hieracium aurantiacum* (one of the Hawkweeds), with warm brownish orange-red flowers; Hollyhocks, *Lychnis chalcedonica*, *Montbretia crocosmiæflora* (in a warm soil and sunny place), Pentstemons, a host in themselves, but are not very hardy; and *Rudbeckia Newmani*. This is a respectable list, and will provide a good selection.

Bulbs.—The town gardener should place faith in bulbous flowers, which seem little upset by stuffy surroundings. They should be grown liberally indoors, in window-boxes, and in the open. True, they deteriorate more quickly than those in more airy gardens, but bulbs are cheap, and therefore quickly replaced at a reasonable outlay. Daffodils are invariably a success for two years, when the ground has been carefully prepared and they are planted at the proper time, viz. in September or quite early October. *Allium Moly.*, yellow, and *A. neapolitanum* the writer has seen become almost weeds. The autumn-flowering *Amaryllis Belladonna* will thrive in a sunny, warm, south border, preferably against a wall, and other good things are the pretty little Chionodoxas of spring, Crocuses, Crown Imperials (*Fritillaria imperialis*), Snowdrops, *Galtonia candicans* (late summer flowering; it has a tall spike, with snowdrop-like flowers), Spanish and English Irises (always a success and very cheap), Lilies, Grape Hyacinths (Muscari), Scillas, particularly the late spring-flowering *S. hispanica* or *campanulata*, *Triteleia uniflora*, and Tulips.

GALTONIA CANDICANS

Annual Flowers.—These should be made excellent use of. Seeds, even those saved from the finest flowers, are very cheap, and therefore sown so thickly that the results are disappointing. Neither attempt too much, nor sow a preponderance of one thing, so that it monopolises the garden to the exclusion of everything else. The Sweet Pea should be well represented by groups of one variety, say mauve, white, rose, and so forth, colours, of course, most agreeable to the possessor of the garden. Tropæolums (Nasturtiums) are very bright and useful for cutting, but they must not be allowed too free play. Mignonette is welcome for its grateful perfume, so too is the night-flowering Stock. The following is a short

list of a few good annuals for a town garden : Marigold (but only a few ; it is a terrible weed, if so bright and wholesome looking a flower can be described in this way), Celosias, from seed sown under glass in spring ; *Aster sinensis*, a handsome, tall, purple single flower; one of the China Asters (sow seed in heat in spring), *Chrysanthemum tricolor* or *burridgeanum*, the beautiful major and minor Convolvuluses, Coreopsis, Chinese and Indian Pinks, the old-world Extinguisher-flower (Eschscholtzia), *Gypsophila elegans*, Everlastings (if they are cared for), Lupins, Mignonette, the blue Nemophila, Love-in-a-Mist (Nigella), Poppies (these are very beautiful, especially the "Shirley" kinds, but they must be well thinned), Phlox Drummondii, Salpiglossis, Scabious, Stocks (these should be freely planted for colour and perfume), Sweet Peas, Foxgloves (biennial), Verbenas, Virginian Stock, and Zinnias, quaint flowers of various colours, raised in heat in spring.

Summer Flowers.—When the garden boasts a little greenhouse, many things known as "bedders" can be raised, but this is only possible where artificial warmth can be given during the winter. Many town gardens, and others for that matter, are rendered bright chiefly through the agency of summer bedding plants, the "Geraniums," or Zonal Pelargoniums as they should be called, Tuberous Begonias, Zinnias, Dahlias, Ageratums, Celosias, Cockscombs, the China Asters, dwarf Lobelias, the Tobaccos, especially the sweet-scented *Nicotiana affinis* and the newer *N. sylvestris*, which has white tubular flowers which do not flag or close up under a hot sun as in the case of *N. affinis ;* Petunias, very successful in town gardens, bright flowers of many colours—sow seed in spring under glass ; Verbenas, easily raised in gentle heat in spring, and if very large plants are required, Cannas (not usually very happy near towns), and such big-leaved things as the Castor-oil Plant. As a rule, however, exclude everything of tall spreading growth, otherwise the garden will contain nothing else, and before the summer is half over be a choke-muddle place, full of unruly growths and struggling vegetation, all striving for the mastery, and a hunting-ground for slugs and snails.

Climbers.—The beginner is frequently perplexed as to the Climbers to select for the wall of the house or to clamber over a summer-house or arch. Of annuals the Japanese Hop is remarkably vigorous. Seed sown in March, or even in early April, will result in plants that will clamber over trellis or summer-house in one season. Climbing Tropæolums (Nasturtiums), Convolvuluses, or the Canary Creeper, with light green growth and bright yellow flowers, are available. This

LAVENDER AS A HEDGE.

is called *Tropæolum canariensis*. Of permanent Climbers the Ivy is the most satisfactory if occasionally cut hard back in spring, removing almost every leaf; and of deciduous kinds the Virginian Creeper is safe. The kind that clings most tightly to the wall is called *muralis;* it is not so well known as *Veitchi*, but is freer, the growths being close to the wall without that excessively rigid character conspicuous in a *Veitchi*. When the garden is not in the centre of a town, but a few miles (say five) outside, of course the list of plants that may be grown is more extensive. Against a south wall may be planted the beautiful *Ceanothus azureus*, which will reach almost to the chimney stack, a surface of delightful blue flowers in summer; the Winter Sweet (*Chimonanthus fragrans grandiflorus*), which bears pale lemon-coloured deliciously fragrant flowers upon its leafless shoots in winter; the evergreen but not very hardy Mexican Orange-flower (*Choisya ternata*), the handsome big-leaved Dutchman's Pipe (*Aristolochia Sipho*), *Clematis Jackmani*, *C. montana*, which also succeeds against a fence, a vigorous climber with a profusion of white flowers in late spring; the Vine, not omitting the Japanese Vine (*Vitis Coignetiæ*), with its immense leaves dyed crimson with colour in autumn; the pretty, warmth-loving *Eccremocarpus scaber*, White Jasmine; *Kerria japonica fl. pl.* (the double orange-flowered Jews' Mallow), often very beautiful over cottage fronts, the winter-flowering *Jasminum nudiflorum*, Honeysuckles, Passion-flower (the ordinary *Passiflora cærulea* is more beautiful to the writer than the white Constance Elliott), and Roses.

SHOOT OF JASMINUM NUDIFLORUM

History of a Small Town Garden.—The following account of a small garden in the suburbs (west and in Thames valley), and about three miles from the Marble Arch will show how much may be accomplished in quite a small way when suitable plants are obtained and spare time is given ungrudgingly. In this case, however, the possessor of the garden was much occupied with his official pursuits and many evenings occasionally went by when little work was possible: "My garden is small, in a crowded suburb, and when taken possession of presented the usual picture of despair. It was in

truth not a garden at all, but a small plot fresh from the builders' hands. The builder had busied himself in eloping with the rich gravel subsoil and substituting refuse of a varied kind. The ground was taken possession of in September, trenched, good soil substituted for bad, levelled, and before the autumn had far advanced planted with a few things known to prove impervious to the vicissitudes of suburban life. I have pursued the healthy pastime of amateur gardening for many years, and lived once in serener climes, but was at first overcome by this spectacle of builders' rubbish and unholy filching of good soil.

"I noticed that many good garden plants seemed to thrive in the district. In a garden near, perennial Sunflowers shone with a wealth of golden blossom, the Starworts tossed their cool-coloured flowers in the autumn wind, and the Sweet Peas still carried a few fragrant blossoms. So, the foundation having been made, plants were put in, too soon, unfortunately, as it afterwards happened—no fault of the plants—that the borders sank, and I had perforce to remake and then relift everything.

"All the things named have succeeded beyond my very moderate expectations. The forecourt garden (in dense shade, the house being placed almost direct north and south), was laid down with turf, and a narrow border made all round, with a Yew hedge against the boundary fence, and for trees, Silver Birch (a beautiful tree, which is a success in the light soil of the neighbourhood), Thorn, Rose Acacia (*Robinia hispida*), and a large green-leaved Holly. In the small border skirting the house are planted the shade-loving Spanish Scilla, Day Lilies, Crocuses, and Snowdrops, all a success, but the Winter Aconites are always poor. Their puny little yellow flowers would scarce cover a small button, so the Eranthis will in the future go on the black list. For climbers, *Ampelopsis Veitchi*, *muralis*, Rose W. A. Richardson, but this being placed on the sunny side of the house the flowers get bleached by the hot sun beating against the wall, and lose their rich cut Apricot-like tint; Gloire de Dijon, a never disappointing rose; Alister Stella Gray, a perfect vision of exquisite orange buds, and whitish expanded flowers; Passion-flower, Honeysuckles, and in the border the fragrant Lavender and Rosemary, two shrubs so picturesque and interesting in colour that I wish amateur gardeners would grow them more. The common Lavender should never be omitted from the garden, whether small or large. My bushes are in a little hot border, upon which the sun shines fiercely, and the soil is light. Here this fragrant blue-flowered bush delights to grow, spreading out into a soft silvery group, and giving quite a handful of flowers

in the autumn for the house. It should be gathered when the buds are about half-open, not waiting until they expand. It is pleasant to see a China Rose thrusting its flowery shoots into the Lavender bush ; it is a happy flower marriage. In the same warm light border revels the Rosemary, a shrub filled with fragrance and delighting in sunshine.

"*Borders* run round the three sides of the back garden, which faces almost due south, a favourable and pleasant position. Grass occupies the centre, a grateful and refreshing setting to the flower masses encircling it, and under the pantry window is a narrow border, if it can be so called, of light soil ; the position is in full sun. Here revel many things, the beautiful little early Irises, *I. alata* and others, and the early-flowering coloured Gladioli are quite at home. I have never seen the bulbs happier even in the south of England, and one year *Crinum Moorei* flowered superbly. Of course, Crocuses, Scillas, the splendid Gesner Tulips, and Daffodils are a success. When *Tulipa gesneriana* is fully open in the blazing sunshine this is in truth a place of colour. Against the wall Roses are planted—Gloire de Dijon, Alister Stella Gray, and Mme. Berard Roses, with a plant also of *Choisya ternata* and Passion-flower Constance Elliott. The left-hand border, looking down the garden, is filled with many things—annuals, such as Sweet Peas, Mignonette, Tufted Pansies, Day Lilies, Carnations, Pinks, and other homely English flowers, the majority of which are quite well known. How well Carnations succeed ! The old crimson Clove gave handfuls of bloom ; but even better was Uriah Pike (What a name !), a vigorous variety, with firm tall stems and large crimson-coloured fragrant flowers. This kind should be noted by all town gardeners. The old white-fringed Pink was very beautiful too. I had an edging of White Pinks, but alas, wireworms consumed many ; and this reminds me that new loam or the top spit from a pasture should always be most carefully examined, as it is frequently full of wireworms. A friend planted an edging about thirty yards long of White Pinks, brought in new soil to give them a start, and the wireworms consumed three parts of the entire margin of silvery tufts. In this left-hand border plants flourish amazingly ; even Roses, particularly the Tea-scented Edith Gifford, the beautiful hybrid Tea, Viscountess Folkestone, Mme. Charles, and the lovely Alfred Carrière, which has large, loosely formed, pure white flowers filled with sweet scent. Against the fence the winter-flowering *Jasminum nudiflorum* is very beautiful throughout a mild winter. It is covered over with blossom, so rich in colour and fragrant ; the green leafless shoots are crowded with buds in winter, and these when cut for the house open

perfectly in water. A tall vase with *Jasminum nudiflorum* shoots is very pretty and refreshing in winter. No climber flowering in winter is more valuable in the town garden than this; it is impervious to soot and dirt generally.

"The border at the lower end of the garden is in the shade of a row of Poplars and tall houses near. Ivies cover the fence with a dense covering, and in the border itself the Day Lilies flourish, whilst last summer the crimson Phlox, Etna, flowered well. *Scilla campanulata* (the Spanish Scilla) increases, and Polyanthuses, Tuberous Begonias, and Irises are at home too.

"**The German or Flag Iris** is one of the most important of town garden flowers. True its flowering time is not of long duration, but the silvery-toned sword-like leaves are always pleasant to see, and there is great variety of flower colouring. The plants succeed even in the shade, and may be put in during the spring or in the autumn, but perhaps the best time is immediately after flowering. There is something satisfying in colonies of German Irises, especially the blue varieties, Atropurpurea, Purple King, or the new Black Prince. Where space admits a garden of summer Irises may be made, but in the ordinary border may be grown in large clumps the best of the group, beginning in May with the old blue German. This is quickly followed by the white-grey Iris of Florence. My favourites are Mme. Chereau, white, feathered with lavender; Queen of May, rose and lilac; Pallida Dalmatica, a tall kind with beautiful pale blue flowers; Victorine, rich purple, and white; and the ordinary Blue Flag, so familiar in English gardens. The German Flag will grow even upon a London railway bank, but is worth a layer of manure beneath the roots, not in contact with them, at planting time.

"The border by the gravel path is margined with stone, which is now almost covered with Stonecrops, Saxifrages, and Creeping Jenny; whilst near the drawing-room window, in a border running to the steps, English and Spanish Irises are planted alternately. Nothing in the whole range of bulbous plants gives more pleasure than the beautiful colouring of these two groups. The pure colours of the Spanish Iris are irresistible, and if my garden were larger, I should form colonies of them, in amongst shrubs, anywhere, to get the full value of their exquisite shades. The bulbs are so cheap that one might use them as potatoes and save household expenses. The English Iris blooms about a fortnight later, and has flowers in which the segments are broader and flatter than those of the Spanish Iris. Of course the 'English' Iris is not a native, but comes from Spain and the Pyrenees; it probably obtained its popular name through the bulbs having first come to Bristol and thence were transferred to Holland. The

Dutch merchants, thinking the plant was a native of these isles, named it the 'English' Iris—a sad misnomer.

"*General Hints.*—I think my letter has exceeded all reasonable bounds, but a few general hints that I have found produce good results in town gardening may be given. During warm summer evenings after a hot day, syringe the plants gently. This is very refreshing and helpful. Stir the soil occasionally to prevent 'caking' of the surface. This surface stirring lets in light and air to the roots. When watering do so thoroughly. Never dash the hose upon anything and everything. Cut the flowers freely, especially of such things as annuals, which quickly collapse when seed pods are allowed to form, some more so than others. Poppies and Sweet Peas are of brief duration when called upon to bear a double burden. Of course watch for slugs and snails. Never leave refuse about, and in the management of the lawn always keep the grass moderately short. It is a mistake to have a thorough lawn cutting at stated intervals, long grass is difficult to cut and the machine suffers. With regard to cats, I wish some one would give me a remedy. I dislike using fire-arms—my neighbours would grumble; but I confess I am inclined to practice the gentle art of 'potting.'

"*Keeping Plants in Winter.*—When the garden boasts of a greenhouse, it is easy to accommodate the Pelargoniums, Dahlias, Tuberous Begonias, and other tender summer plants during the winter. When the first frost has spoiled their beauty, lift them, and, in the case of Geraniums, pot them up, but Dahlias, after the soil has been removed from the tubers, may be stowed away under the stages. Corms of Tuberous Begonias should be stored in silver sand, and put away in a dry place. Dahlias and Begonias may be stored in a frost proof cellar, and where there is no greenhouse, shake the soil from the roots of Geraniums or even Fuchsias, and hang the plants head downwards from a peg or a beam. Some will die, but many will live, and start away in the spring, when they can be potted.

"I think I must have exceeded my limit, and, in conclusion, give this advice to town gardeners, that success only comes when the gardener tries to understand the flowers he professes to love. Failures are the result usually of a languid interest in a healthy and fascinating pastime to those who try to learn something themselves of the flower world about them. I have written nothing about fruits and vegetables, but the remarks upon the cultivation of these in other parts of this book apply to the town garden. As a rule, however, there is no space for the culture of either."

A CALENDAR OF SIMPLE MONTHLY WORK[1]

JANUARY

Flower Garden.—There is less work in the garden at this time than at any other, as the ground should have been prepared before this; but make all arrears good at once. Those who have frames may with advantage sow a few half-hardy annuals, but it is useless to sow too early if the plants cannot be grown on under frame culture until the spring is well advanced. Plants needed for beds or grouping, such as Ageratums, Musks, Cinerarias, or similar subjects, specially the single Begonias, may now be sown. Now is a good time to rearrange new quarters, rockwork, finish planting of any kind if the weather is open, lay turf, gravel, and drain or make walks. Plants wintered in frames, such as Pansies, will need care to prevent damping, and free ventilation in favourable weather.

Vegetables.—Those who have land still needing digging should lose no time. Peas may be sown in pots in frames for early use to plant out in March. In open weather Broad Beans may be sown, choosing the Early Long-pod section, but only in a warm, dry soil is it wise to sow thus early. Seed Potatoes in the store should be got in readiness, specially the early kinds. These are best placed end-ways, the eyes upwards, in shallow boxes ready for planting, and placed in a cool corner near the light to encourage sturdy shoots. Frame Potatoes should be planted. Also cover Seakale to blanch; manure is not a necessity, it blanches well under pots with a simple covering of soil or leaves. The same remark applies to early Rhubarb; this will force if lifted and placed in any out-of-the-way dark spot, such as under a greenhouse stage. Seeds of all kinds should be procured; old stocks examined and tested for future work.

Fruit Garden.—Planting in mild weather should be pushed forward, and all nailing, except Peaches and Nectarines, completed. Hardy Vines may with advantage be given new surface food in the way of a rich compost, adding bone-meal freely. Pruning should be completed, and in the case of very thick old trees of standard Apples and Pears, thin out cross branches, useless or badly-placed wood, to admit light and obtain finer fruits. New trees planted in the autumn should be staked securely, also a mulch given in severe weather, using any spent manure for this purpose. Shoots may be cut for grafting and trees headed down, and the shoots laid in soil under a north wall until required.

FEBRUARY

Flower Garden.—More half-hardy seeds may be sown now than advised previously, and if means are at hand to propagate by cuttings or division, increase the stock in this way too. In mild winters the herbaceous borders may be thinned, plants that have become poor given manure, and others divided. Bulbs pushing through the soil are much benefited, if at all tender, by a mulch of light material or soil drawn up to protect the rising and tender growths. Chrysanthemums should be taken out of the cutting-pot if struck early. Late cuttings may be struck. Dahlias started into growth in frames to make cuttings; the latter are much better than old tubers planted.

Vegetables.—This month, no matter how small the garden, is a month of work, as in sheltered spots a start may be made with early Peas, Beans, and Salads, such as Lettuce and Radishes. A few Potatoes may be planted under a north wall. Onions sown in well-prepared land, the seed-beds made as firm as possible both before and after the sowing.

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[1] This is a calendar of simple monthly duties in the garden, and will prove helpful to beginners and young gardeners as a reminder of the importance of sowing and planting at the right time. Future success greatly depends upon this.

Of course the work can only be done when the soil is sufficiently dry to tread upon. Parsnips, if needed of a large size, should be sown, giving these plants ample room, 18 inches between the rows being none too much; thin the plants to half that distance. Celery for early use should be sown in pans or boxes. Only a small quantity will be needed thus early. Tomatoes also should be sown thinly to grow on in pots; see varieties in table for this purpose. If glass is not at command, far better purchase plants than sow too early.

Fruit Garden.—Strawberry quarters, from which a crop was obtained last year, will well repay feeding at this date. If not given food in the autumn, merely hoe the surface—not dig—and spread the manure close round the plants, cutting away old leaf growth. Small runners laid in last autumn should be planted out, and new plantations made firm by treading. Raspberry canes may now be shortened to the proper length, and the canes supported. If food can be given, they may have a good top dressing. All pruning of Peaches and Nectarines should now be completed, and this is a good time to dress trees. Syringe walls to get rid of insect pests; this will save labour in the summer. It may be necessary, near towns, to net Gooseberry trees, as small birds inflict much damage this month; they are also kept at bay considerably by using black cotton between the branches. This is a good time to give these trees manure, lightly forking it in; and in gardens where Gooseberries are troubled with caterpillars in the summer, remove the surface soil, burn, and give some new material.

MARCH

Flower Garden.—The work in this garden will now begin, as though, in a late season, grass mowing will not be necessary, a certain amount of labour in rolling and making things as neat as possible must be done. Tall creepers should be trained, old and poor wood cut out, and new wood laid in; specially in the case of Roses, as the best flowers are produced on the new wood. Roses in beds should now be pruned, and the beds made neat, the surface being hoed over or lightly forked. Tea Roses that have been given protection should be gradually exposed, and growth shortened; young shoots should be encouraged from the base. Sow flower seeds, not so much however as next month; but those who have glass can sow a number of half-hardy plants, and save much time.

Vegetables.—A start must be made in the open if good Brassicas are needed. Beans, both the Long-pod and Windsor, may be sown, the former at the beginning of the month, the last-named at the end. Broad Beans succeed best in a good loamy soil, not too light. It is too early to sow Dwarf Kidney Beans and Runners, but such crops as Spinach, Lettuce, and Globe Beets may be sown; also early varieties of Turnips, such as Milan and Snowball. Carrots, Early Nantes, and the Short-horn varieties should also be sown in light warm soils. Any spare plants of autumn-sown Cabbage planted out will form a succession to those put in during the autumn. Asparagus beds should be given food in showery weather in the way of salt-fish manure, guano, or other special fertilisers; food given now that growth is just active is more beneficial than in the early winter months. Beds should be prepared for planting or sowing, and good results are obtained by deep cultivation and a liberal supply of manure. Asparagus should not be too much crowded as is often the case, a distance at least of 18 inches to 2 feet between the rows is needful. Celery sown in March will soon be ready to prick off into boxes or frames; another or mid-season lot should be sown. All vacant ground should be dug; other, that is cropped, should be hoed over the first opportunity.

Fruit Garden.—Those who have Peach or Apricot trees should give a slight protection from frost; the trees should now be nailed or tied to the walls, and where birds are troublesome look well after small fruits which they soon destroy. Much of the work advised last month may have been delayed by severe weather, and all arrears should now be cleared up.

APRIL

Flower Garden.—This is a most important month to the beginner, as seed-sowing will be more general than at any other season, and much of the future brightness of the garden, say from June to October, will depend upon the labour given during the next few weeks. A hard-and-fast line with regard to dates cannot be given to the beginner for various reasons, the chief one being that we are dependent upon climatic conditions, as even in April the soil may be too cold or too wet at the beginning of the month. This will delay sowing still later. The soil should be in what is termed a friable condition—that is, it should not clog or stick together, but break up freely; and no matter what seeds are sown, success is always greater when the soil is well prepared. Too deep sowing means failure in a cold, wet spring, so that the nature of the soil, if light or heavy, should be considered. If the latter, cover more lightly, or, better still, give a little lighter

soil if obtainable. Many beginners have no glass to raise tender seeds, and, though glass is a great gain, some of the best results are secured with a little care, but with April well advanced, there need be no misgivings as to the seed sown in sheltered borders and the open ground.

Many hardy annual flowers, such as Antirrhinums, Acrocliniums (Everlasting), China Asters, Coreopsis in variety, Canterbury Bells, Candytufts, Annual Chrysanthemums, Clarkias, Cornflowers in variety, Delphinums, Eschscholtzias, Gaillardias, Godetias, Gypsophila elegans, beautiful, light feathery flowers for massing in vases; Larkspur, Lobelias, Amaranthus (Love Lies Bleeding), Lupines, Marigolds, Musk or Mimulus, Myosotis (Forget-me-Not), Mignonette, Pansy, Pinks, Phlox, Penstemon, Rhodanthe, Pyrethrum, Rudbeckia, Scabious, Silene, Stocks, Wallflowers, and Sweet Williams. Sweet Peas sown now will be in bloom in July. All creepers on buildings should be pruned, and new soil given where needed. Roses will now need encouragement, and pruning should be no longer delayed. From this date keep a look-out for insect pests, Lawns will need mowing, but previously should have been well rolled, and if a path wants gravel see to this at once.

Vegetables.—With regard to the vegetable supply, this and May are the worst months in the year, as the winter green things are beginning to run, and springs things are not in. Early Cabbage may be hastened by feeding in dry weather either with liquid manure or guano water; also early Cauliflowers. It is useless to leave old worthless stalks in the soil a day longer than can be helped. Potato planting should now be general. Give the early kinds the most sheltered positions. There is no lack of work in this department, and though what is done will make little show the return will be seen in a few months hence. All kinds of early Broccoli may be sown, also Kales, Savoys, Cauliflowers, and Cabbage for autumn supplies. Carrots, Turnips, Beet, and Parsnips may be sown in late soils, but for keeping for winter use May sowings are advisable for Beet, Carrots, and Parsnips. All ground should be dug as it becomes vacant. A small sowing of Dwarf French Beans may be made towards the end of the month. Spinach should now be sown every three weeks to maintain a regular supply. Vegetable Marrows may be sown on a hot-bed if the latter is made up at this date. Some of the best Marrow Peas should be sown for July and August supplies. Sow thinly in rich land. Lettuce and Radish should be sown as needed; the latter on a north border.

Fruit Garden.—There is less work to do in this department than in the others, as pruning will be over, but Apricots and Peach trees will need attention. All shoots upon Apricots that proceed direct from the trees, should be stopped to within a couple of inches of the base; these are called foreright shoots. Those that are at the side are needed for extension, and will later on be tacked or tied in. Peach and Nectarines need disbudding. This is often totally neglected by beginners, and if all shoots are allowed to grow, the trees are a mass of spray and give few fruits. In disbudding leave a couple of good buds at the base or bottom of each shoot. These are the shoots needed for next year's fruit, and stop within two inches. One good bud or young shoot should be left above the fruits, and rub off weak ones. Let the work be done piecemeal, a little every other day, as then the trees do not suffer. To sum up the work of disbudding—leave sufficient wood for next season's fruiting, as the fruit shoots that are bearing this year will be cut out when the crop is cleared, and the shoots will be tied or nailed in as they increase in size, not over the fruit to hide them, but alongside wherever there is room. Green and black-fly are troublesome pests upon Peach trees, and must be checked as soon as seen by syringing with tepid rain water mixed with one pound of soft soap to three gallons of water. Well work the soap into the water, until it is like milk, then wet all parts of the tree. Tobacco water may be used, or quassia, but it is better to syringe several days in succession in the evening than in too strong doses. Strawberries should be planted early in the month if the plants were too small to put in during autumn. Raspberries will benefit by manurial mulching, and this also applies to old Strawberry quarters. Gooseberry trees infested with caterpillars should receive a dressing of soot and lime under the trees, even if the old soil were removed previously. All newly-planted trees will benefit by a mulch or surface covering of manure, and staked securely when necessary. The soil between fruit trees should be hoed over to stop the growth of weeds.

MAY

Flower Garden.—Much of the work advised last month may still remain unfinished owing to weather being unsuitable, so that, as regards seed sowing, the same advice holds good. The beginner should remember that the garden will be brighter if some kinds of flower seed, which are of short duration, are sown every few weeks in small quantities, thus giving much better cutting material. This applies to such flowers as Mignonette, Gypsophila, and other quick growing plants. Seedlings sown early and

WALK OF EVENING PRIMROSES.

just large enough to handle should be thinned. Many beautiful hardy flowers are ruined through sowing too thickly and leaving all to chance. Others may, with advantage, be transplanted or gaps made good, and where others have failed more may be sown. In favourable weather, half-hardy things may now be planted, and such plants as Geraniums, but only towards the end of the month. These, if purchased, should be well exposed for a little time before planting. When brought direct from a house or from under glass, they lose their leaves badly and take weeks to recover. All plants for autumn and spring beds are best sown this month; there must be no further delay. Dahlias may be planted, Carnations staked. A sharp look-out is now necessary with Roses, to keep clear of insect pests. Mow the lawn weekly, roll walks when possible, and the flower garden will be most enjoyable.

Vegetables.—This is a very busy month, as every spare bit of land should now be made the most of. Plant autumn Cauliflowers and Broccoli in fairly good soil, Savoy, Kale, and late Broccoli in land not recently manured, as plants, to stand the winter, must not be at all over-luxuriant, but as hard as possible. Lettuce should be transplanted, and more seed sown. Broad, French, and Runner Beans should now be sown, the first-named in a cool border, heavy soil if possible, the two latter in diverse soil and a warm, open position. Sow Runner Beans from the 10th to the 20th of the month, according to the locality. These like a rich root run. Celery should be secured for early supplies, and trenches made for a later lot. Some of the best Marrow Peas, such as Autocrat and Ne Plus Ultra, should be sown in well-manured land for August and later supplies. Turnips should be sown on a cool border, and kinds that will stand dry weather, such as Red Globe, as from this date this vegetable is attacked by fly. If any of the late Broccoli or Kales have failed, sowings made now will make up for losses. Give Asparagus beds occasional dressings of salt and liquid manures or nitrates well watered in. Early Potatoes should be moulded up as soon as large enough. The Dutch hoe should be kept going between growing crops, and watering done if actually needed.

Fruit Garden.—Stopping and training in shoots of Peach and Nectarine trees will need more attention this month than previously, and in cold soils the tender foliage of the Peach frequently suffers. One of the worst troubles is mildew, which may be stopped by syringing with a sulphur solution, also in very slight cases dusting over the trees when damp with flowers of sulphur. Royal George Peach quickly becomes mildewed. All fruits of Apricots, Peaches, and Nectarines should now be thinned, and with care after this date few fruits will fall. Strawberry beds that are intended to bear should now be mulched with clean litter or straw to protect the fruit. Grass is used at times, but short grass is objectionable in wet weather; but that from fields cut at this date, before the seeds are matured, and laid straight, forms a good protection and does not seed like straw litter. Newly-planted trees may need water, and it is well to thin the fruits severely as they form, leaving sufficient to test variety.

JUNE

Flower Garden.—This month will show some return for labour previously expended. This is an excellent time to sow seed of hardy perennial or biennial flowers, which make a charming display not only for one year, but yearly, as many may be propagated afterwards by division of root or cuttings. Finish all planting out, and stake or support anything needed. It is better to do this early before the plants get injured. Now is a good time to kill weeds on walks. Use weed-killers when the weather is dry. Roses may be fed with liquid manure, or use fertilisers. Roses attacked with green-fly will need syringing with soapy or tobacco water, and in wet seasons, should mildew show itself, dust over with dry sulphur. Use a small hoe freely between growing plants to keep down weeds. All creepers will need attention for a time to keep them in place, as those on buildings will grow unwieldy.

Vegetables.—In this portion of the garden the beginner will now be having a good supply of Cabbage. Cauliflower and early Peas should now be turning in; to make provision for sowing more of such kinds as were advised last month, or in poor soils the early kinds may be sown now to give late supplies. Ashleaf Potatoes will now be ready to lift for daily use, but the bulk will benefit by being left a little longer in the soil. Celery, Vegetable Marrows, and any other tender plants should be planted; also Tomatoes and Cucumbers. Tomatoes, either on walls or stakes, should be trained to one main growth, and not given a too rich root run; far better feed from the surface when fruits are formed. Lettuce should be sown for later use, and in dry soils sow very thinly in drills to save transplanting, merely thinning out the rows. Endive, a very beautiful salad plant, may be sown for early supplies, but in dry hot weather defer sowing until July. Runner Beans should be staked neatly, giving the stake a crossbar support. Plant out all kinds of green vegetables for autumn, winter, and spring supplies. Sow Coleworts for October and

November use. These are delicious little Cabbages. Pickling Cabbage may be sown for cutting next year, if desired large. Sow Turnips as previously advised.

Fruit Garden.—This month will call forth the energies of the grower as so many things require attention; for instance, laying-in of new wood, stopping gross shoots, cleansing, and watering are all-important details. Avoid crowding healthy trees on walls; the Peach must have light to develop the growth. Many Peach trees lose shoots in severe winters because the wood is soft, but this will not be so if the advice given above is carried out. In olden days the Vine was a favourite plant (profitable also) on buildings, and this needs a little attention. Disbud freely, only leaving the strongest, best-placed shoots; these to be secured when strong enough to the wall or building. Rub off weak, useless spray growth, and stop strong shoots two joints above the bunches if such shoots are not needed for extension. All wall trees will benefit greatly by being damped over late in the day with the hose or syringe, especially Peaches, Nectarines, and Apricots; and these trees should not be dry at the roots, whilst they well repay food in the shape of liquid manure. Young Gooseberry trees will benefit by having a portion of the fruit gathered, and the same remark applies to other fruit-trees. Overcropping is a mistake.

JULY

Flower Garden.—This is a variable month with regard to weather. At times it is hot and dry, at others thunderstorms are frequent. If the former, the water-pot must be used freely, and there will be a great saving of labour if a light cover or mulch can be given tender plants, such as need moisture. This placed over the surface or between the rows will prove of much benefit. Many tall-growing plants, such as Canterbury Bells and Dahlias, will need stakes, weakly growths cut away from others, and cuttings may be struck in a shady border. Now is a good time to divide Garden Pinks, as soon as the flowers are past. Polyanthuses may be sown this month for next spring-flowering. These are very beautiful, if a good strain of seedlings is obtained. Roses will need the attention advised last month with regard to mildew and old bloom removed when past. Chrysanthemums should be planted out of pots from plants struck in the spring; older plants will need feeding and thinning of shoots or stopping.

Vegetables.—In case the weather is hot and dry, more attention will be required in watering and feeding, especially when the things have been recently planted. Gather all vegetable crops as they mature, and do not allow Beans to become old. Gather regularly, also feed in dry weather. Runner Beans in a light soil frequently cast their flowers in hot, dry weather. Water liberally, and top the plants at a height of 6 feet from the soil. If Dwarf Beans are liked, make a sowing of Progress or Iron Horse on a cool border in rich soil, in drills 2 feet apart, and thin to 3 inches between the plants when above the soil. Cabbage seed must be sown this month. A good date is from the 10th to the 20th, according to the locality if north or south, and such kinds as Ellam's Dwarf Early or Sutton's April cannot be beaten. Coleworts may be sown for late autumn supplies, also Lettuce and Endive. Carrots of the short-horn type for drawing in a young state in autumn and winter. All land should be cleared of decaying vegetable matter. Vegetable Marrows given liquid manures, and the strong growths stopped to induce setting; the plants delight in moisture overhead later in the day in hot weather. Parsley should be sown, other herbs dried for winter use, and the hoe used freely when possible.

Fruit Garden.—After the ripe strawberries are gathered the cultivator can either layer young runners for new beds or grow the old ones on. We advise both, as by having a new bed yearly and destroying an old one there is always a good supply of fruit. The plants like a well-cultivated soil, and if a little heavy so much the better. Give plenty of well-rotted manure, and keep runner growth cut away. Old plants retained may be cut over, the older leaves being removed to give the new crowns more light and room. This work is best done as soon as the crop is cleared, and in making new beds, if possible give a fresh root run, using the old bed for vegetables for a time. Raspberries will benefit by a mulch of rich material, also moisture in dry weather. Cherries will need attention, as black-fly is a great nuisance, and to destroy this the portion of the tree infested should be given a thorough wetting over either of quassia or tobacco water, dusting over afterwards with tobacco powder. The same advice given last month as regards stopping and laying in shoots is applicable. Feed, water, and syringe, except where fruit is ripening. A sharp look-out must be kept for the Apple moth. This is best destroyed by hand picking.

AUGUST

Flower Garden.—The Carnations will soon be past their best, and the earlier the young growth can be layered the better. This is a simple process, and is described elsewhere. Pansies strike freely now from cuttings, also many other plants that have

PINKS AND PÆONIES.

made a fair growth. All old flowers should be removed, and growths regulated. Mignonette should be sown for late flowering, and the seed-pods of Sweet Peas removed as soon as possible, as if these remain the plants will stop flowering. They well repay liberal supplies of food, such as liquid manure. In hot weather watering will be needful. If lawns are watered, this must be done regularly and late in the day. Growths of Dahlias will need thinning out. Stake the plants too. This applies to other strong-growing things. Roses may be cut over to regulate gross growths, the old blooms removed, and food given in the shape of liquid manure or fertilisers.

Vegetables.—If by any mishap the seeds of Cabbage sown as advised last month have failed, make good the loss at the earliest opportunity. In dry weather cover the seed-beds with mats to assist germination, removing them as soon as the seedlings come through the soil. Colewort and Celery should be planted. Give water liberally in dry weather. Spring-sown Onions should be harvested, well drying the bulbs and storing in a cool place. A sowing of the winter kinds, such as the Tripoli, should be made in drills 18 inches apart in firm soil. Land needed for Cabbage should be prepared; those quarters just cleared of spring Onions are suitable. Hoe the soil over and draw drills rather than digging the land afresh. Spinach should be sown for autumn, and Cauliflowers for spring cutting, also Dwarf Beans on a warm border, giving abundance of moisture if the soil is dry. Turnips and Lettuce should be sown in small quantities, and the roots of the earlier Turnips lifted and stored in a cool place. Lift mid-season potatoes and clamp them, as they must not be exposed too long as they soon get discoloured. Mould up early Broccoli, Kales, and Brussels Sprouts, remove all old useless matter, stack Pea stakes as the plants are cleared, and keep the surface soil well stirred.

Fruit Garden.—To get the best results from early varieties of fruit, such as Apples and Pears, gather a few fruits daily to extend the season. Peaches are best gathered early in the day or late. The fruits bruise more easily when picked whilst warm. These trees will take a lot of moisture if under dry walls in light soils. The planting of Strawberries should not be delayed. Those layered last month will now be ready, and each plant should be made firm and planted so that the soil is just level with the crown. Water freely in dry weather after planting. The old fruiting canes may with advantage be cut out of Raspberries, allowing three to five new growths for next year, cutting away others. Hoe freely among the fruit trees, and protect late Cherries and other small fruits that are to be kept for some time. Lay in young wood of Cherry trees, also other stone fruits. Shorten growths of others, and destroy American blight, where present. This especially refers to young Apple trees.

SEPTEMBER

Flower Garden.—The flower garden will need more attention to keep it bright, as with shortening days leaves will fall and more tidying up be necessary. If previous advice has been followed in the way of sowing annuals, these will keep bright well into October. This is the best time to purchase bulbs for a spring supply, and at the end of the month plant Hyacinths, Tulips, Crocus, &c, Both Crocuses and Daffodils succeed well on grass, as they make a charming feature in the garden early in the spring, and reappear yearly. Now is a good time to commence new ground work and make walks, as the work can be done so much easier now than in mid-winter, when the land is not in workable condition. The grass must still be mown, as often after heat and drought it springs up quickly. Now is a good time to strike Roses from ripened shoots. Cut them about 18 inches long and trim to half the length, inserting the shoot in quite firm sandy soil.

Vegetables.—Make as much as possible of the tender vegetables at this date, as we may now expect frost at any moment, and this will cripple the crop. Towards the end of the month cover a good lot of Dwarf Beans from the July sowing, as if covered over at night and exposed in the day they may be kept good for some time. Vegetable Marrows long keep good after being cut if the stalk end is placed in water in a cool shed; the same plan may with advantage be adopted with Runner Beans and Peas, but only sufficient moisture given to cover the stalk, not the pod, and put a few lumps of charcoal in the water to keep it sweet. All kinds of Brassicas that are to stand the winter should be moulded up. Towards the end of the month the earliest cabbage should be planted, making the seedlings firm. Coleworts, also, of the late variety, the Hardy Green, will be useful from December to March if planted rather close together; they then give a good return. Turnips should be stored, others thinned. Asparagus beds should be watered if the weather is dry; it is far better to feed now than in winter, but after the early part of the month food will not be needed.

Fruit Garden.—The beginner in a way will have less work and more returns, as early

Apples and Pears will need gathering, but do not hurry this work. Many of our best Pears will not keep long, and these should be left as late as possible. Far better, in the case of late varieties to lose a few fruits by dropping than a large number when in the store by shrivelling and premature decay. Apples left as long as possible on the trees always colour better and keep longer. Many gardeners leave late kinds on the trees in a favourable season until the early part of November. As soon as Peaches and Nectarines are gathered, what is termed the old fruiting wood should be cut away; namely, the small shoots that have borne fruit, and if, as advised when disbudding, two or even one shoot were left at the base, these now will be full grown and take the place of the wood cut out. By cutting out this wood now the new growth made will have a better chance of ripening. Branches of Figs on walls should be thinned, and weak growth removed. By doing this work now, little pruning will be needed in spring.

OCTOBER

Flower Garden.—Work amongst the flowers will principally consist in clearing away old plants that have done their duty, and replacing with others of a hardier nature. Wallflowers, Forget-me-Nots, Sweet Williams, and such like plants should now be lifted from their summer quarters with a ball and planted in the beds. Now is the best time to lift evergreens if the soil is sufficiently moist. It is necessary to have a ball of earth and roots to each plant. Should the weather be dry, soak the plants previous to their removal. All tender plants should be given shelter. Bulbous rooted ones, such as Begonias, should be placed in fine soil or loose fibre, and kept dry in a greenhouse. Cannas will winter under stages or in dry cellars. This also applies to Begonias, as in many small gardens glass is not at command. Dahlias need similar treatment, also Cardinal Lobelias, which are beautiful summer plants. Calceolarias winter well in places merely protected from severe frost if not kept too moist in winter.

Vegetables.—All late Potatoes should be lifted this month and clamped—that is, they are placed in heaps on a layer of clean straw, and covered with straw, and over this soil from 9 inches to 12 inches in thickness. Make the outside smooth with the back of the spade. Seed Potatoes should be more freely exposed to harden the tubers, either on shelves or in boxes in layers. Mould up Celery without delay; finish Cabbage planting, and do not rely on a very early sowing or planting as in mild winters. These run or bolt, and the crop is lost. When planting now, select medium-sized sturdy plants, and plant in an open position in rows, 15 inches between the plants and 18 inches between the rows. Protect early Cauliflower by tying the leaves at the top. This also applies to the autumn Broccoli. Cauliflowers sown a few weeks ago should be planted on a warm border, or at the foot of a south wall; or if hand-glasses or frames are at hand, they winter well under these. Plant a good batch of late Lettuces on a warm, well-drained border, lifting the seedlings carefully to keep the roots intact.

Fruit Garden.—This is a busy month, as there is fruit to gather and store, and new trees to select and plant. The best plan is to plant as soon as the leaves fall, and the trees must be ordered some time in advance. In planting, if the soil is fairly good, dig deeply, but avoid manures. Such materials as old lime, rubble, or chalk, are most beneficial where there is an absence of lime. In the case of heavy clay ground, give drainage—such as brick rubble, and incorporate some lighter materials. Burnt refuse, road scrapings from limestone roads, and bone meal will greatly assist poor soil. Plant in suitable weather, and do not finally nail up the trees to walls until the soil has settled down. Root prune trees that grow too gross—that is, cut out a good workable trench, say from 2½ feet to 3 feet, and the same depth. Cut the roots well under the trees, and fill in with some new soil, adding such aids as advised above (not manures; add these to the soil needing improvement).

NOVEMBER

Flower Garden.—There will be little to accomplish this month. Rolling the walk or walks frequently, the grass also, and if at all poor use a coarse rake or harrow over it, and pull out weeds and moss. Place on some fresh soil to which has been added a good portion of bone meal, say one-fourth part, and such materials as old leaf-mould, marrow beds, burnt refuse, and road scrapings, are excellent. At this dull season any new work may be taken in hand, such as beds, walks, or borders. Replant shrubs, or cut out and give others support if needed. Cover Tea Roses with some light litter, or anything that will protect the stems at the part near the surface. It is a good plan to draw up soil over this portion, as then, should a severe winter cut down the old growths, new ones will spring

up at the base. Other Roses with fat shoots may be shortened a little to make them more shapely, but must not be pruned until March.

Vegetables.—This work will be one of preparation for next season and protection for later supplies. The same advice with regard to Cauliflower and Broccoli is more necessary now than last month. Frost plays sad havoc with the tender flower; it is wise to lift those plants with heads of a fair size by their roots, and lay them together rather closely in sheds or cellars, and use as desired. All vacant ground should now be dug, and even in the smallest garden trenching should not be forgotten. If the soil is very poor add manure liberally and double dig—that is, placing the manure under the first spit and digging the second, not bringing the latter to the surface; it is merely deep digging and manuring at a depth of about 7 inches to 9 inches from the surface. Artichokes should be lifted and clamped, like Potatoes, Turnips stored, and Beetroot also. Carrots, if large, are hardy, but worms and slugs injure them in wet soils. Seakale may be covered over, and leaves or warm litter used to start the crowns into growth. Rhubarb may also be covered in this way, or lifted and forced in a warm cellar.

Fruit Garden.—Though little can be done but what was advised last month, it is well to complete the planting. Early planted trees may be nailed in their right places, and others that need support in the way of stakes must be attended to without delay. Detach small twiggy shoots of Peach and Nectarine trees from the wall and by doing this the wood is hardened by exposure. At the same time there is no better period of the year to get rid of scale or other pests on wall trees. For the former a solution of Gishurst compound, an old remedy but a safe and effective one, cannot be surpassed. This syringed all over the trees, and the wall thoroughly soaked, will kill the pest. Mildew is also apt to reappear year after year, and Gishurst with sulphur in equal proportions, is an excellent dressing. Trees in the open that are infested with American blight should be painted over with Gishurst to which has been added soluble petroleum, or the latter may be used alone. If petroleum in a soluble state is not handy, use half a pound of soft soap to half a pint of petroleum, adding rain water to make it weaker, if for syringing; for use as a paint on the blight, use a paint brush and rub it in.

DECEMBER

Flower Garden.—The last month in the year is a resting month. Get rid of all decaying leaf matter, and whenever possible dig it in the open ground, as this feeds and sustains root growth. Beds in which bulbs have been planted may be too forward; if so, protect them with cocoanut fibre refuse or leaf-mould. All tender shrubs recently planted will benefit by some loose litter being placed over the roots. Others loose through high winds may be trodden over, or the surface soil lightly rammed. Creepers on walls may be trained, and old wood cut out. This applies more especially to those kinds that bloom on the young wood. Prepare soil for future use, and select seeds needed for another season. Choose the quarters by making a rough plan for future use.

Vegetables.—Much the same advice holds good as for last month. Complete digging if possible. Make use of old heaps of manure. Examine the root-store frequently, and turn out decaying matter. Globe Artichokes do not winter well in many gardens. They may be protected by placing fine ashes over the crown. This is better than litter; the latter in wet seasons often causes decay. Keep Potatoes as cool as possible. Asparagus beds that need more surface soil may now with advantage receive any old compost, in which a liberal portion of bone meal has been added. Place this on the beds, but all weed growth should be cleared before giving new soil. In severe weather roots that are stored may need more protection in the shape of long litter.

Fruit Garden.—Pruning will be the most important work needing attention at this date. Wall trees should receive attention first, and especially Apricots, but here there will be little to prune if stopping was carried out as advised. A few main shoots may need regulating to replace losses. Remove old ties, and cut away the small spray made late in the autumn. Peaches and Nectarines should be left until last, but these and Apricots may with advantage have new soil or a surface-dressing, raking away the old soil and giving new, to which has been added a good fertiliser. December is not the best month, but there is more time for the work, which, if left later, is often overlooked. Currants and Gooseberries should be pruned, but where birds are troublesome delay the work and cover the trees with fresh lime and soot, when the shoots are damp. Old Apple and Pear trees may be thinned out, removing all cross branches, but do not shorten leading shoots. Figs on walls may need protection if the shoots are detached. Mat them up until the spring.

A GARDENING CHART

THE object of the following tables and lists is to compress as much useful information into as small a space as possible, and to give the beginner a ready guide to matters of garden importance.

ANNUAL FLOWERS

An annual flower is so called because seed sown in the spring results in seedlings that flower the same year. A Tropæolum (Nasturtium) is an annual for this reason; and a biennial means a plant the seed of which is sown the year before the seedlings bloom. Gardeners, and the term is used in its broadest sense, have yet to unlock the treasures of the annual group of flowers. Their true value is almost unknown, even amongst those who, we presume, know much of the great flower life about them. Of late years many charming kinds have been raised, flowers which show a marked improvement upon the weedy things of former days, and offering too a greater variety of colours.

LIST OF ANNUALS

HH = Half-hardy. Seed must be sown in boxes or pots in slight warmth, in early spring, subsequently planting out in May in good garden soil. Many kinds may be sown later (May) in the open ground.

H = Hardy. These may be sown in early spring in the open ground.

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Acroclinium roseum pl. . . (hh)	Rose	1	July, August
Alyssum odoratum . . . (h)	White, Fragrant	½	July to Sept.
,, ,, Little Gem . .	,,	⅓	,, ,,
Anthemis Kelwayi . . . (h)	Soft Yellow	1½	June, August
Asters— (hh)			
Dwarf Chrysanthemum, Comet, Triumph, Light Blue, Mignon, Ostrich Feather, White Lady, &c. .	Blue, White, and various shades	½ to 1½	July to October
Aster sinensis (very fine flower), single (h)	Purple	1	Summer
Balsams, in variety . . . (hh)	Various	1 to 2	July, Sept.
Calendula officinalis grandiflora pl. (h)	Rich Orange	1	July, October
,, ,, Meteor, fl. pl. (h)	Orange Striped	1	,, ,,
,, ,, sulphurea pl. (h)	Sulphur	1	,, ,,
Calliopsis grandiflora atrosanguinea .	Dark Crimson	2	,, ,,
,, Drummondi	Yellow, and Crimson centre	1½	July, Sept.
,, Crimson King . . .	Crimson	¾	July, August
Canary Creeper (see Annual Climbers). (h)			
Candytuft, in variety . . . (h)	Crimson, Purple, White, &c.	¾	July, Sept.
Celosia pyramidalis coccinea . (hh)	Scarlet	2	,, ,,
,, ,, aurea . . .	Golden	2	,, ,,
,, ,, Thompsoni . .	Crimson	2	,, ,,
Note.—These especially require to be sown in frames early in April, and transplanted to permanent quarters later on.			

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Centaurea Cyanus (Corn-Flower) . (h)	Blue, Purple, Rose, Flesh	3	Early Summer
Chrysanthemum tricolor . . (h)	White & Yellow	1	Early Summer. The double kinds are capital pot plants
,, ,, atrococcineum	Dark Scarlet	1	
,, ,, burridgeanum	White & Crimson	1	
,, ,, Eclipse . .	Yellow & Scarlet	1	
Clarkia elegans rosea pl. . . (h)	Rose	2	July to Sept.
,, ,, Purple King . .	Purple	2	,, ,,
,, ,, Salmon Queen . .	Salmon-Rose	2	,, ,,
,, pulchella integripetala . .	Magenta	2	,, ,,
,, ,, Mrs. Langtry . .	White & Crimson	1½	,, ,,
Cockscombs, in variety . . (hh) *Note.*—Best grow quickly as pot plants; require most liberal treatment.			
Cosmos bipinnatus	Purplish, White, &c.	Varies	Autumn This autumn-flowering annual has quickly gained favour since it has been rather recently brought forward. Its flowering season unfortunately is too late—October—except in very mild autumns. But a correspondent advises sowing in February in slight heat, transplanting the seedlings to a cold frame when 2 inches high, and planting in April in a sunny place, when it can be had in bloom by August. The white kind is the best, and though the plant grows tall—7 to 8 feet—the finely divided foliage, of a wholesome full green colour, is graceful and pleasant to the eye. The flowers are valuable for cutting, and last well in water.
Dianthus imperialis (Double Crimson) (h)	Crimson	1	July, August
,, sinensis Heddewigii, in variety	Various	¾	,, ,,
,, ,, The Bride . .	White predominating	¾	,, ,,

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Dianthus sinensis laciniatus superbus grandiflorus . .	Various	¾	July, August
Note. — The above forms of the Pink are very beautiful in beds or in lines, and all are of quite easy culture.			
Eschscholtzias, in great variety . (h)	... ...	¾	June to Oct.
Note. — These glowing annuals are especially well suited to poor stony soil, and frequently grow and flower quite freely in the gravel paths.			
Erysimum peroffskianum . . (h)	Orange	¾	June, July
Eucharidium Breweri . . . (h)	Pale Rose	¾	,, ,,
Eutoca viscida . . . . (h)	Fine intense Blue	2	July, Sept.
Gaillardia picta . . . . (hh)	Yellow & Crimson	2	,, ,,
,, ,, lorenziana . . .	Dark Crimson and Yellow	1½	,, ,,
Note. — These are best sown in autumn in frames and planted out early in spring, end of March or thereabouts.			
Godetia, Lady Albemarle . . (h)	Crimson	1½	,, ,,
,, carminea aurea . . .	Rose & Yellow	1	,, ,,
,, Princess of Wales . . .	Dark Crimson	1½	,, ,,
,, Duchess of Albany . . .	White	1½	,, ,,
,, Fairy Queen	White chiefly	1	,, ,,
Gypsophila elegans rosea . . (h)	Rose	1½	See Note
Note. — By sowing at intervals of every three weeks this may be flowered for months in succession.			
Helianthus cucumerifolius . . (h)	Rich Yellow	3	July, October
,, ,, Stella .	Deep Yellow	3	,, ,,
,, ,, Orion .	Rich Yellow	3	,, ,,
Note. — Miniature sunflowers; very fine for cutting.			
Helianthus californicus plenus . (h)	Yellow, Double	5	August, Sept.
,, Golden Nigger . . .	Yellow	5	,, ,,
,, Leviathan	Largest Yellow	10	Sept., October
Note.—The last is a noble plant, and a splendid ornament among shrubs, &c.; rich and deep soil.			
Helichrysum, in variety . . (hh)	Various	2	August, Sept.
Note. — These are the so-called "Everlastings," and may be cut and dried and kept for use in winter in vases.			
Heracleum giganteum . . . (h)	White	12	August
Note. — Cow Parsnips of huge proportions; most suitable for the wild garden or woodland.			
Ionopsidium acaule . . . (h)	Sky Blue	3 inches	June
Note. — Sow at intervals this charming carpet plant.			
Larkspur, Dwarf Rocket, and other kinds . . . . (h)	Various	1 to 2	Midsummer
Leptosiphon densiflorus . . (h)	Rose Lilac	1	,,
Limnanthes Douglasi . . . (h)	White & Yellow	½	May & June, & July & Aug.
Note. — Fine bee plant; good for autumn sowing.			

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Lathyrus azureus (Lord Anson's Pea) (h)	Blue	2	Summer
,, odoratus, in many varieties . *Note.*—The Sweet Pea of Commerce. See special article.	Various	3 to 4	,,
Linum grandiflorum rubrum . . (h)	Scarlet	1	,,
Love Lies Bleeding, in variety . (h)	Various	2½	Summer and Early Autumn
Lupinus luteus . . . . (h)	Yellow	2	June to August
,, nanus	Blue & White	1½	,, ,,
,, hybridus, in variety . .	Various	...	,, ,,
,, subcarnosus	Flesh & White	2	,, ,,
Malope grandiflora . . . (h)	Crimson	2	Summer and Autumn
,, ,, alba . . .	White	2	,, ,,
,, ,, rosea . . .	Rose	2	,, ,,
Marigolds, in variety . . . (h) *Note.*—Some are given under their botanical name—Calendula, which also see.	Various	1 to 2	,, ,,
Mignonette, Crimson Giant . . (h)	Crimson	1	By frequent sowings, December in pots for earliest. Then in March in open, or February in frames, and in succession in April, May, and June
,, Bismarck	Buff	1	
,, Golden Machet . . .	Golden	1	
,, Machet	Buff	1	
,, Ruby	Red	1	
,, Salmon Queen . . .	Salmon	1	
Nasturtium, Tom Thumb varieties (h)	Various	1	Summer and Early Autumn
,, tall climbing sorts . .	Various	Climber	,, ,,
Nemophila insignis . . . (h)	Blue, White centre	½	Early Summer
Nicotiana sylvestris . . . (hh)	White	4	August to Oct.
,, affinis . . . . . *Note.*—Sow in March in frames; plant out end of May.	,,	2 to 3	,, ,,
Nigella damascena . . . (h)	Light Blue	1	August, Sept.
Pea, Sweet*			

* As the selection of varieties named on p. 43 may be too small for those who are enthusiastic admirers of the Sweet Pea, we give the following classification decided upon by the Classification Committee held in July 1900 in connection with the Conference and Sweet Pea Bi-centenary:—*White:* Blanche Burpee, Emily Henderson, Sadie Burpee. *Blush:* Duchess of Sutherland, Modesty, and Sensation. *Yellow* or *Buff:* Queen Victoria, Mrs. Eckford, Venus. *Pink:* Lovely Katherine Tracey, Prima Donna. *Rose:* Her Majesty, Prince of Wales, Royal Rose. *Carmine:* Lord Kenyon, Prince Edward of York, Princess Victoria. *Crimson:* Firefly, Mars, Salopian. *Maroon:* Black Knight, Duke of Clarence, Shazada. *Lavender:* Countess of Radnor, Lady Grisel Hamilton, Lady Nina Balfour. *Mauve:* Captivation, Dorothy Tennant, Duke of Westminster. *Blue:* Captain of the Blues, Emily Eckford, Navy Blue. *Salmon* or *Orange Selfs:* Chancellor, Lady Mary Currie, Oriental. *Red* or *Rose Stripe:* America, Aurora, Mrs. J. Chamberlain. *Mauve Striped:* Columbia, Gaiety, Queen of the Isles. *Blue Striped:* Gray Friar, Juanita, Waroona. *Maroon* or *Purple Striped:* Princess of Wales, Senator. *Red* and *Rose Bicolor:* Duke of York, Little Dorrit, Triumph. *Salmon* or *Orange Bicolor:* Countess of Paris, Gorgeous, Meteor. *White Ground Fancies:* Alice Eckford, Duchess of York, Ramona. *Yellow* and *Buff Fancies:* Duchess of Westminster, Lottie Hutchins, Stella Morse. *Picotee Edge:* Golden Gate, Lottie Eckford, Maid of Honour. *Early Forcing Varieties:* Emily Blanche Terry, Mont Blanc.

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Phacelia campanularia . . (h)	Intense Blue	1	June to August, warm soils
Poppies, in variety . . . (h)	Various	1½ to 2	Early and Late Summer
Note.—Such as the Shirley, Carnation-flowered, and French kinds are recommended.			
Rudbeckia bicolor superba . . (h)	Black & Gold	2½	August, Oct.
Salpiglossis sinuata . . . (hh)	Various	3 to 5	Summer. A very graceful annual, useful to cut for the house, but unfortunately it frequently dies off wholesale. A well-known gardener writes:—"I think I may safely say that one reason why they are not more often seen in gardens is the aggravating habit they have of dying off wholesale and leaving blanks in the beds or borders. Gardeners fight shy of such plants when there are other things that can take their places with greater certainty. I feel perfectly safe in tracing the cause of this tiresome habit to the method recommended for cultivation, *i.e.* raising the plants in warmth and treating them as half-hardy annuals. Failure is courted in this way, as a large number of the plants so raised is almost certain to collapse. If growers were content to leave the seeds in the packets until May, and

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Salpiglossis sinuata . . . (hh)	Various	3 to 5	then sow where the plants are to stand, there would be no fear of blanks and very much better growth would result. The seed germinates quickly, and the seedlings grow slowly at first, though after they are about 3 inches high progress is again rapid, and by the middle of August, or earlier in hot seasons, there will be a glorious display of flower, lasting until the advent of frost and an abundance to cut from in the meanwhile. I do not claim that there will be no losses, as some are certain to die, but by judicious thinning, and spreading this operation over three or four weeks, there will be no blanks in the bed or plot, and satisfactory results will ensue. A check to growth is the great bane of this and a few other tender annuals, the Zinnias for instance, and I am sure that those who grow Salpiglossis largely will agree with me that the above is the only way to deal with them in order to command success." The flowers of

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Salpiglossis sinuata . . . (hh)	Various	3 to 5	the Salpiglossis appear on slender stems about 3 feet in height, and are quaintly striped and coloured. Sometimes self-coloured varieties occur, a pure yellow or crimson, and these must be treasured.
Saponaria calabrica . . . (h)	Pink	½	July, August
,, ,, Scarlet Queen .	Scarlet	½	,, ,,
Schizanthus pinnatus . . . (hh)	Purple & White	1½	June, August
,, papilionaceus . . .	Chequered	1½	,, ,,
Schizopetalon Walkerii . . (h)	White	1	Summer
Statice Suworowi . . . . (h)	Rose, Crimson, and White	1½	Early Summer. Very fine
Sweet Sultans, in variety . . (h) *Note.*—Sow in succession.	Purple, White, and Golden Yellow	1½	June to August
Tagetes (French Marigold)—			
,, signata pumila . . (hh)	Yellow	6 inches	Very bright flowers for rich soil. Most effective in masses.
,, patula, Legion of Honour (hh)	Yellow and Rich Brown	A few inches	
,, erecta (African Marigold) (hh)	Orange and Yellow	2	Autumn. The African Marigolds are splendid annuals, making masses of colour in the autumn garden. They should be more often grown. Lemon Queen, lemon colour, and Prince of Orange, orange, are very rich.
Venus' Looking-Glass . . . (h)	Blue	½	Summer
Virginian Stock, in various colours (h)	Red, White, Crimson	⅓	Early Summer
Viscaria cardinalis . . . (h)	Crimson	1⅓	Summer and Early Autumn. Very profuse flowering
,, cœrulea	Blue	1½	
,, Dunnetti	Rose	1½	

A SELECTION OF ALPINE AND ROCK PLANTS

ABBREVIATIONS as follows :—s, *shade ;* hs, *half shade ;* p, *peat ;* o, *ordinary garden soils ;* l, *loam ;* gl, *gritty loam ;* rl, *rich loam ;* c, *carpet plants ;* t, *tuberous rooted ;* tg, *of trailing habit ;* b, *bulbs.*

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
Acæna microphylla . . . (c)	Crimson	June, Aug.	4	o
Acantholimon glumaceum (Prickly Thrift)	Rose	June, July	5	o
Acantholimon venustum . . .	Pink	July, Aug.	4	gl
Achillea (Milfoil) ageratoides . .	White	July, Sept.	9	gl
,, aurea . . . . (c)	Golden	,, ,,	6	o
,, tomentosa . . . (c)	Yellow	,, ,,	6	o
,, Clavennæ	White	June, July	9	o
Adonis vernalis	Yellow	Mar., April	9	rl
,, pyrenaica	,,	May, June	9	s, gl
Æthionema grandiflora . . .	Pink	July, Aug.	6	gl
Ajuga genevensis . . . (c)	Pale Blue	May, July	9	o
,, pyramidalis . . . (c)	Lilac Blue	,, ,,	9	o
,, reptans purpurea . . (c)	Blue	,, ,,	6	o
Alyssum saxatile . . . . A most useful flowering plant.	Yellow	Spring	4	o
Androsace lanuginosa . . (tg)	Pink	June, Oct.	6	gl
,, sarmentosa . . .	Rose	June	6	gl, hs
,, carnea	Flesh-pink	May, June	4	gl
Anemone alpina (Windflower) . .	White, shaded Blue	,, ,,	1½ ft.	rl
,, ,, sulphurea . .	Sulphur	,, ,,	1½ ft.	rl
,, blanda . . . . (t)	Various	Mar., April	6	l
,, Halleri	Purple	July	9	l
,, narcissiflora . . .	White	July, Aug.	12	o, l
,, palmata . . . . (t)	Yellow	May, June	12	p, l, s
,, Pulsatilla (Pasque-flower) .	Purple	Mar., May	12	rl
,, robinsoniana . . (t)	Sky Blue	April	6	rl
Antennaria tomentosa (Cat's Ear) (c)	White	July, Aug.	6	o
Anthyllis montana	Purple	,, ,,	6	o
Aquilegia alpina	Blue	June	9	gl
,, cœrulea	Pale Blue	June, July	15	l
,, Stuarti	Deep Blue and White	May, June	9	gl
Arabis albida . . . . . There is a very pretty double white.	White	Spring	6	o
,, lucida fol. var. . . .	,,	June, July	4	o
Arenarias balearica (Sandwort) . (c)	,,	,, ,,	2	grit
,, grandiflora . . . (tg)	White, large	May, June	4	o, l
Armeria alpina rosea (Thrift) . .	Rose	,, ,,	6	o
Arnebia echioides (Prophet-flower) .	Straw Yellow	Spring & Autumn	12	p, l
Aster alpinus	Lilac Blue	May, June	8	o
,, ,, albus	White	,, ,,	8	o
,, ,, ruber	Rose	,, ,,	8	o
Astragalus dasyglottis (Milk Vetch) .	Purple	July, Sept.	3 trailing	o

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
Astrantia major	Blush	July, Sept.	9	o
Aubrietia deltoidea grandiflora	Purple	April, June	4	o
,, Leichtlini	Rose	May, June	4	o
,, græca superba	Lilac	May, July	4	o
,, Hendersoni	Purple	,, ,,	5	o
,, Souvenir de Wm. Ingram	Red-striped	May, June	4	o
All this group are dense growing carpet plants, covered with bloom in spring; masses of colour.				
Bulbocodium vernum (b)	Purple	Feb., Mar.	4	o, l
Campanula alpina	Dark Blue	July, Aug.	9	o, l
,, garganica	Blue & White	July, Sept.	Trailing	o
,, ,, hirsuta	,, ,,	,, ,,	,,	o
,, Hendersoni	Blue	Sept., Oct.	12	rl
,, Hostii	Dark Blue	July, Aug.	12	o
,, ,, alba	White	,, ,,	12	o
,, pelviformis	Palest Blue	June, July	6	gl, s
,, muralis	Light Blue	May, June	4	o
,, pulla	Deep Purple	July, Aug.	6	gl, s
,, pusilla alba	White	June, July	6	o
,, Raineri	Blue	,, ,,	4	l, p, s
,, G. J. Wilson	,,	July, Sept.	6	o
,, Profusion	Clear Blue	Aug., Sept.	8	gl
Cheiranthus alpinus (Alpine Wallflower)	Sulphur	April, May	6	gl
,, Marshalli	Orange Yellow	,, ,,	6	gl
Chionodoxa Luciliæ (Glory of the Snow) (b)	Blue & White	Feb., Mar.	6	o,
,, sardensis (b)	Deep Blue	Mar., April	6	o, l
Colchicum autumnale (b)	Lilac	September	6	o
,, ,, plenum (b)	,,	,,	6	o
,, ,, album pl (b)	White	,,	6	o
,, speciosum (b)	Rose Lilac	Sept., Oct.	9	rl
Corydalis nobilis (t)	Yellow	April, May	9	p, s
Crocus speciosus (b)	Purple	Sept., Oct.	6	l
Crucianella stylosa coccinea (c, tg)	Scarlet	July, Sept.	6	o
Cyananthus lobatus	Blue	Aug., Oct.	4	gl, p
Cyclamen hederæfolium (b)	Pink	Sept., Oct.	6	l, p, s
,, ,, album (b)	White	,, ,,	6	l, p, s
Daphne rupestre	Purple	Aug., Sept.	4	p, s
,, Cneorum	Rose Purple	April, May	6	p, s
Dianthus (Pinks) alpinus	Red	July, Aug.	4	gl
,, callizonus	Rose	Summer	4	gl
,, neglectus	Pink	July, Aug.	4	gl
,, dentosus	Crimson	,, ,,	6	o, l
,, glacialis (Rock Pink)	Rose Red	,, ,,	3	gl
,, squarrosus	White	Aug., Sept.	9	o
,, fimbriatus	Lilac	July, Aug.	9	o
,, deltoides (Maiden Pink)	Red	June, Aug.	9	o
,, cruentus	Blood Red	,, ,,	12	l
,, arenarius	White	,, ,,	6	gl
Draba aizoides	Yellow	Mar., April	4	o, l
,, ciliata	White	April	4	o, l
Dryas Drummondi (tg)	Yellow	July, Aug.	Trailing	gl
,, octopetala (tg)	White	,, ,,	,,	gl
Edraianthus serpyllifolius	Violet Purple	June, July	6	gl
Epilobium obcordatum (Willow Herb)	Rose Pink	Aug., Oct.	9	gl, p
Epimedium alpinum	Red	May, June	9	p, s
,, pinnatum elegans	Yellow	Mar., May	12	p, l, s
,, musschianum	White	,, ,,	9	p, l, s

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
Erigeron aurantiacus	Orange	July, Aug.	6	o, l
,, glaucum	Lilac	June, July	9	o, l
Erinus alpinus	Lilac Purple	March, May	3	grit
,, ,, albus (Stork's-Bill)	White	,, ,,	3	grit
Erodium hymenoides	Pink	July, Sept.	12	o
,, Manescavi	Purplish Crimson	June, Aug.	15	o
,, macradenum	Pale Purple	,, ,,	9	gl
,, Reichardi	White	July, Oct.	Carpet	gl, s
Genista prostrata (tg)	Yellow	July, Aug.	Trailing and Shrubby	o, l
,, tinctoria fl. pl. (tg)	Golden	,, ,,		
Gentiana acaulis (Gentianella)	Blue	Spring	6	o
,, bavarica	Intense Blue	,,	3	p, l, s
,, septemfida	Blue & White	Summer	9	gl, s
,, verna	Deep Blue	Spring	3	l, s
Geranium cinereum	Rose Pink	June, Oct.	12	o
,, sanguineum	Red	June, Sept.	6	o
,, ,, album	White	,, ,,	6	o
Geum montanum	Golden	May, July	9	rl
Gypsophylla cerastioides	White	June, Aug.	6	gl
,, prostrata (tg)	Blush	,, ,,	Trailing	o
Haberlea rhodopensis	Bluish lilac	May, June	6	gl
Hedysarum alpinus	Red	,, ,,	6	o
,, sibiricum	Reddish Crimson	,, ,,	6	o
Helianthemum (Sun Rose), in variety	Various	June, Sept.	Sub-trailing shrubs	o
Hepatica, in variety	,,	Mar., April	6	rl, s
Herniaria glabra (c)	Greenish	...	Carpeter	o
Heuchera sanguinea	Scarlet	June, July	15	rl, hs
Horminum pyrenaicum	Bluish Purple	July, Aug.	8	rl, s
Hutchinsia alpina (c)	White	June, July	6	o, l
Iberis correæfolia (Candytuft)	,,	May, June	8	o
,, sempervirens	,,	,, ,,	8	o
,, tenoreana	White & Lilac	,, ,,	6	o
Iris cristata	Blue	June, July	4	gl
,, nudicaulis	Purple Blue	May, June	9	o
,, pumila, in variety	Various	April, May	6	o
,, stylosa	Sky Blue	Dec. to Mar.	12	p, l, s
,, ,, alba	Ivory White	,, ,,	12	p, l, s
,, ,, speciosa	Azure Blue	Feb., Mar.	9	p, l, s
,, reticulata (b)	Rich Violet	,, ,,	9	rl
Lewisia rediviva	Rose & White	May, July	4	gl, in rock crevice
Leontopodium (Gnaphalium) alpinum (Edelweiss)	Pale Yellow and White Woolly-heads	July	6	l, and lime-stone
Linaria alpina (Alpine Toadflax)	Blue & Purple	June, Aug.	4	gl
Lithospermum prostratum (Gromwell)	Deep Blue	May, Sept.	Trailing	gl, s
Lychnis alpina	Pink	April, May	6	o
,, Lagascæ	Rose	June, Aug.	4, trailing	gl
,, pyrenaica	White	April, June	6	gl
Myosotis alpestris (Alpine Forget-me-not)	Blue	,, ,,	4	gl, s
,, azorica	Deep Blue	June, July	6	l, s
Narcissus Bulbocodium (b)	Pale Yellow	Mar., April	4	l, p
,, minor (b)	Yellow	,, ,,	6	rl

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
Narcissus minimus . . . (b)	Yellow	Mar., April	4	rl
,, pallidus præcox . (b)	Sulphur & Yellow	,, ,,	9	gl
Nierembergia rivularis (White Cup) (c)	White	June, July	6	l, s
Omphalodes luciliæ	Palest Blue	July, Oct.	5	gl, p, hs
,, verna . . . (c)	Deep Blue	Mar., May	3	l, s
,, ,, alba . . (c)	White	,, ,,	3	l, s
Œnothera macrocarpa (Evening Primrose) . . . . (tg)	Yellow	June, Sept.	9	rl
,, taraxacifolia . . .	White	June, Aug.	6	o, l
Onosma taurica (Golden Drop) .	Yellow	May, July	9	gl, on rocky ledge
Othonna cherifolia	,,	May, June	12	l
Ourisia coccinea	Scarlet	July, Aug.	9	rl, s
Pentstemon glaber	Blue	,, ,,	9	l
,, heterophyllus . . .	Red and Blue	July, Sept.	12	l
,, speciosus . . .	Blue	,, ,,	6	l
,, Menziesi . . .	Scarlet	June, Aug.	6	gl
Petrocallis pyrenaica	Blush	May	4	gl
Phlox canadensis	Slate Blue	April, May	12	rl
,, frondosa . . . . (c)	Pink	,, ,,	4	l
,, Nelsoni . . . . (c)	White	,, ,,	4	l, hs
,, ovata	Red	May, July	12	rl
,, procumbens . . . (c)	Pale Purple	June, July	4	gl s
,, verna . . . . (tg)	Reddish Crimson	May, June	Creeping	gl
,, amoena . . . . (c)	Reddish Pink	,, ,,	6	rl
,, setacea (c) as follows:—				
The Bride . . .	White	April, June	4	rgl
Compacta . . .	Rose	,, ,,	4	rgl
Vivid	Scarlet	,, ,,	4	rgl
Model	Mauve Pink	,, ,,	4	rgl
Atropurpurea . . .	Dark Purple	,, ,,	4	rgl
Phyteuma comosa	Blue	June	6	gl, rock crevice
Plumbago Larpentæ . . .	Ultra Blue	Aug., Sept.	12	rl
Polemonium confertum . . .	Blue	May, June	8	gl
,, Melittum . . .	White	,, ,,	8	gl
Polygala chamæbuxus . . .	White and Yellow	,, ,,	6	l, p, s
,, ,, purpurea ..	Yellow and Purple	,, ,,	6	l, p, s
Polygonum brunonis . . .	Rose	Aug., Oct.	9	o
,, vaccinifolium . . .	Pink	Aug., Sept.	6	l, p
Potentilla alpestris	Yellow	May, Aug.	6	rl
,, Menziesi	Orange	,, ,,	6	rl
,, atro-sanguinea . . .	Deep Red	Aug., Sept.	9	l
Primula (Primrose) rosea . . .	Rose Scarlet	Early Spring	6 to 12	rl, s
,, cashmeriana . . .	Lilac Purple	,, ,,	18	rl
,, denticulata	Pale Lilac	,, ,,	12	rl
,, ,, alba . . .	White	,, ,,	12	rl
,, ,, Munroi . .	Ivory White	Early Summer	6	rl, s
,, viscosa	Rose Purple	Spring	4	gl, s
,, ,, nivea . . .	Snow White	,,	4	gl, s

Note.—Almost every known species of Hardy Primula would be permissible in this list, and quite worthy of inclusion, but the

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
number is too formidable to give in detail. The large majority, however, may be safely regarded and treated as in the case of the last named.				
Puschkinia scilloides . . (b)	Blue & White	Spring	6	rl
Ramondia pyrenaica (Rosette Mullein)	Purple	June, July	6	moist shady
,, ,, alba . .	White	,, ,,	6	rocks
Ranunculus alpestris . . (t)	,,	,, ,,	6	gl
,, amplexicaulis . . (t)	,,	April, June	4	rl
Saponaria ocymoides splendens (tg)	Rose Crimson	Summer	Rock	o, l
,, ,, alba . . (tg)	White	,,	trailers	o, l
Saxifraga aretioides primulina . .	Primrose Yellow	April, May	6	gl
,, burseriana	White	Mar., April	4	gl
,, ,, major . .	,,	,, ,,	4	gl
,, coriophylla . . .	,,	April, May	6	gl
,, cochlearis	White, Pink spots	May, June	9	gl
,, Cotyledon	,,	June	12 to 18	gl
,, longifolia	White	Summer	9 to 18	gl
,, muscoides . . . (c)	Pale Yellow	Early Spring	3	moist
,, ,, atropurpurea (c)	Crimson	,, ,,	4	ordinary
,, hypnoides . . . (c)	White	June	5	loam,
,, oppositifolia . . (c)	,,	Mar., April	3	or a position of half-shade
,, ,, pyrenaica, splendens, and others . (c)	Rose Purple	,, ,,	3	
,, Wallacei . . . (c)	White, Large	May, June	6	
Note.—The remarks at foot of Primulas apply with equal force to this very numerous family, which, indeed, is largely composed of the best forms of Alpine vegetation.				
Sedums	...	August	...	...
Sempervivums	...	,,	...	...
Note.—These may be included, the former being frequently used as carpets to other flowers, the latter in dry, sunny positions, or in rocky chinks and crevices, where few things thrive.				
Silene (Catchfly) acaulis . . .	Rose	June, July	2	gl
,, alpestris . . . . (c)	White	,, ,,	5	o, l
,, maritima plena . . (tg)	Double White	,, ,,	Trailing	o, l
Sisyrinchium grandiflorum . (t)	Red Purple	Mar., April	9	rl
,, ,, album (t)	Satin White	,, ,,	9	rl
Thalictrum anemonoides . . .	White	April, May	6	l, p, s
Thymus lanuginosus . . . (c)	Purple	June, July	Carpet	o, l
Tiarella cordifolia (Foam-flower .	Creamy	May, June	12	rl
Tropæolum polyphyllum . (t, tg)	Yellow	June, July	Trailing	l
Veronica Allioni	Deep Blue	May, June	6	o, l
,, prostrata	,, ,,	June	3	o, l
,, rupestris	Rich Blue	June, July	4	o, l
Zauschneria californica . . .	Vermillion	July, Sept.	12	gl
,, splendens . . .	Scarlet	,, ,,	12	gl

ROSES

ROSES (BUSHES) FOR QUITE A SMALL GARDEN

NAME.	COLOUR.	CLASS.	STOCK.
Common Moss	Pink	Moss	Own Root
Celestial	Blush	Alba	Manetti
Ulrich Brunner	Red	Hybrid Perpetual	Briar or Own Root
Mrs. J. Laing	Pink	,,	,,
Charles Lefebvre	Dark Crimson	,,	,,
Baronne de Maynard	Snow White	,,	,,
La Rosiere	Very Dark	,,	,,
La France	Pink	Hybrid Tea	,,
Caroline Testout	Deep Pink	,,	,,
Viscountess Folkestone	Blush White	,,	,,
Camoens	Deep Rose	,,	,,
Marie Van Houtte	Pale Yellow	Tea	,,
Gloire de Dijon (for wall or fence)	Cream	,,	,,
W. A. Richardson	Orange & White	Noisette	,,
Common Monthly	Pale Pink	Chinese	Own Root
Mme. Laurette de Messimy	Rose & other shades	,,	,,
Hon. Edith Gifford	Ivory White	Tea	,,
Souvenir de la Malmaison	Flesh	Bourbon	Briar or Own Root

ROSES AS BUSHES OR SHORT STANDARDS FOR WINDY PLACES

NAME.	COLOUR.	CLASS.	STOCK.
Charles Lawson	Rose	Hybrid Chinese	Own Root
Mme. Plantier	White	,,	,,
Paul Ricaut	Crimson	,,	,,
Chenedole	,,	,,	,,
Scotch Roses	Various	Scotch	,,
Mme. Hardy	White	Damask	,,
La Ville de Bruxelles	Rosy Pink	,,	,,
Maiden's Blush	Blush	Alba	Own Root or Manetti
Blanc Double de Courbet	White	Rugosa	,,
Mrs. A. Waterer	Red	,,	,,
Rugosa rosea	Pink	,,	,,
,, alba	White	,,	,,
Blanche Moreau	,,	Moss	,,
Gen. Jacqueminot	Red	Hybrid Perpetual	,,
Jules Margottin	Cherry	,,	,,
John Hopper	Pink	,,	,,
Magna Charta	Deep Pink	,,	,,
Caroline Testout	Rose	Hybrid Tea	,,
Mrs. J. Laing	Pink	Hybrid Perpetual	,,
Ulrich Brunner	Red	,,	,,
Ella Gordon	Crimson	,,	,,
Armosa	Silvery Pink	Bourbon	Own Root
Common Monthly	Pink	Chinese	,,
Fellenberg	Light Red	Noisette	,,
Mrs. Paul	Blush	Bourbon	Own Root or Manetti
Cheshunt Hybrid	Magenta	Hyb. Tea	Own Root or Briar
Gloire de Dijon	Cream	Tea	,,
Camoens	Deep Rose	Hybrid Tea	,,

ROSES FOR ARCHES AND PERGOLAS

NAME.	COLOUR.	CLASS.	STOCK.
Reine Olga de Wurtemburg.	Light Crimson	Hybrid Tea	Own Root or Briar
Claire Jacquier . . .	Nankeen	Polyantha	,,
Aimée Vibert . . .	White	Noisette	,,
Aglaia	Yellow	Multiflora	,,
Leuchtstern	Pink, Single	,,	,,
Crimson Rambler . . .	Crimson	,,	,,
The Garland. . . .	Buff	Hybrid Musk	,,
Félicité Perpetue . . .	White	Sempervirens	Own Root
Flora	Pink	,,	,,
Psyche	Flesh Pink	Multiflora	,,
Euphrosyne	Pink	,,	,,
Mme. Alfred Carriere . .	Creamy White	Tea	,,

HYBRID TEAS

TWENTY-FOUR KINDS FOR BEDDING

NAME.	COLOUR.	STOCK.
‖Antoine Rivoire . .	Rosy Flesh	Briar, Seedling or Cutting, or Own Root
*‖Augustine Guinoisseau .	Rosy White, very sweet; flowers well in autumn	,,
Note.—Known as the white La France.		
*‖Aurora	Salmon Pink, very fragrant	,,
*‖Camoens	Glossy Rose, most abundant and continuous bloomer	,,
‖Captain Christy . .	Flesh Pink	,,
*‖Caroline Testout . .	Salmony Pink, not very sweet, but a good Rose	,,
*‖Gloire Lyonnaise . .	Lemon White	,,
*Grace Darling . . .	Cream, Shaded Pink, splendid grower and very hardy	,,
*Grand Duc A. de Luxembourg	Clear Pink, reverse of petals Rich Rose	,,
*Gruss an Teplitz . .	Cinnabar Scarlet, very sweet, a superb variety for colour; should be in every garden	,,
*‖Gustave Regis . . .	Nankeen Yellow, splendid long buds	,,
‖ Kaiserin Augusta Victoria	Cream, Shaded Lemon	,,
*Killarney	Flesh Pink, lovely buds	,,
*‖La France . . .	Silvery Pink, one of the sweetest and best	,,
*‖Mme. Abel Chatenay .	Carmine, Shaded Deep Salmon, an exquisite variety and most fragrant	,,
‖Mme. Cadeau-Ramey .	Rosy Flesh, Shaded Yellow	,,
*‖Mlle. Jules Grolez . .	China Rose colour, very bright and pretty	,,
*‖Mme. Pernet-Ducher .	Canary Yellow buds, expanding White, one of the very best for a large mass	,,

NAME.	COLOUR.	STOCK.
*Marquise de Salisbury .	Velvety Scarlet, very showy in the mass, not much individually	Briar, Seedling or Cutting, or Own Root
*‖Marquise Litta . .	Carmine and Vermilion, splendid	,,
*‖Mrs. W. J. Grant . .	Imperial Pink, magnificent in every way	,,
Princess Bonnie . .	Vivid Crimson, very fragrant, semi-double	,,
*‖Viscountess Folkestone .	Creamy Pink, Shaded Salmon, very free and beautiful	,,
‖White Lady . . .	Creamy White, one of the handsomest Roses grown; flowers as large as a Magnolia	,,

The varieties marked thus * are good also as Standards, and those marked ‖ are the best for pot culture, In addition to these latter, the following are first rate for the same purpose:—

NAME.	COLOUR.	STOCK.
Clara Watson . . .	... ...	Briar, Seedling or Cutting, or Own Root.
Duchess of Albany . .	Salmon Pink, fine, almost a red La France, splendid	,,
Exquisite	Crimson, Shaded Magenta, very sweet	,,
L'Innocence . . .	Pure White	,,
Souvenir de Madame Eugene Verdier	White, Shaded Saffron, fine	,,
Souvenir du President Carnot	Rosy Flesh, Shaded White beautiful long buds	,,
The Meteor	Velvety Crimson, extra fine for pots, but requires great heat	,,

PILLAR ROSES THAT WILL GROW TO A HEIGHT OF 7 TO 10 FEET

NAME.	COLOUR.	CLASS.	STOCK.
Gloire de Dijon . . .	Cream and Buff	Tea	Briar or Own Root
Waltham Climber, No. 1 .	Light Crimson	,,	,,
Reine Marie Henriette . .	Cherry Red	Hybrid Tea	,,
W. A. Richardson . .	Orange	Noisette	,,
Carmine Pillar . . .	Carmine	Hybrid	,,
Crimson Rambler . . .	Crimson	Multiflora	,,
Bennett's Seedling . . .	White	Ayrshire	,,
Reine Olga de Wurtemburg .	Rosy Red	Hybrid Tea	,,
Mme. Berard . . .	Salmon Rose	Tea	,,
Aimée Vibert . . .	White	Noisette	,,
Longworth Rambler . .	Light Crimson	,,	,,
Dr. Rouges	Bronzy Red	Tea	,,

The Penzance Briars also make splendid pillars.

SIX PILLAR ROSES OF MORE MODERATE GROWTH

NAME.	COLOUR.	CLASS.	STOCK.
Alister Stella Gray	Yellowish White	Noisette	Own Root or Briar
Gruss an Teplitz	Scarlet	Hybrid Tea	,,
Belle Lyonnaise	Cream	Tea	,,
Gloire de Margottin	Scarlet	Hyb. Perpetual	,,
Purity	White	Hyb. Bourbon	,,
Monsieur Desir	Violet & Crimson	Tea	,,

CLIMBERS FOR GREENHOUSE ROOF OR PILLARS

NAME.	COLOUR.	STOCK.
Bouquet d'Or	Rich Coppery Yellow	Briar, Seedling or Cutting
Celine Forestier	Primrose	,,
Cheshunt Hybrid	Magenta Crimson, a bad colour outdoors, but attractive under glass	,,
Climbing Belle Siebrecht	Imperial Pink, grand	,,
Climbing Kaiserin A. Victoria	Creamy White	,,
Climbing Niphetos	Pure White	,,
Climbing Perle des Jardins	Golden Yellow	,,
Gloire de Dijon	Salmon Yellow	,,
Gustave Regis	Canary Yellow	,,
L'Ideal	Coppery Rose, very beautiful tints prevail in this flower	,,
Madame Alfred Carriere	Salmon White, large	,,
Madame Berard	Salmon Rose	,,
Madame Moreau	Coppery Yellow	,,
Marechal Niel	Golden Yellow. The king of Roses	,,
Monsieur Desir	Velvety Crimson, fine	,,
Reine Marie Henriette	Pale Crimson, known as the red Gloire de Dijon	,,
Reve d'Or	Coppery Yellow buds	,,
Solfaterre	Sulphur Yellow	,,
Waltham Climber, No. 1.	Bright Crimson	,,
W. A. Richardson	Orange Yellow	,,

SO-CALLED CLIMBING ROSES GROWN AS LARGE BUSHES

Where walls, fences, &c., are limited, many of the splendid vigorous Teas and Noisettes may be successfully grown in bush or shrub form. Plant them in October, 3 or 4 feet or more apart, and in March shorten the growths to 2 feet. Each season the annual growths must be thus cut back, and some of the very old wood entirely removed.

NAME.	COLOUR.	STOCK.
Bouquet d'Or	Apricot	Briar
Belle Lyonnaise	Pale Yellow	,,
Cheshunt Hybrid	Magenta Red	Own Root
Germaine Trochon	Bronzy Yellow	Briar
Gloire de Dijon	Cream	,,
Madame Chauvry	Apricot	,,
,, Berard	Salmon Rose	,,
Mons. Desir	Velvety Crimson & Purple	,,
Madame Moreau	Orange	,,
Pink Rover	Pink, very sweet	,,
Waltham Climber	Crimson	,,
W. A. Richardson	Orange	,,

HYBRID PERPETUALS FOR POTS

VARIETY.	COLOUR.	STOCK.
Captain Hayward	Crimson Carmine	Briar or Own Root
Duke of Wellington	Scarlet Crimson	,,
Ella Gordon	Rich Crimson	,,
General Jacqueminot	Scarlet Crimson	,,
Gustave Piganeau	Carmine	,,
Mlle. G. Luizet	Silvery Pink	,,
Magna Charta	Rose	,,
Marie Baumann	Red	,,
Merveille de Lyon	White	,,
Mrs. G. Dickson	Pink	,,
Mrs. J. Laing	Rosy Pink	,,
Mrs. S. Crawford	,,	,,
Pride of Waltham	Salmon Pink	,,
Prince Arthur	Rich Red	,,
Spenser	Blush Pink	,,
Ulrich Brunner	Cherry Red	,,
Victor Verdier	Rose	,,
Violette Bouyer	White, Shaded Pink	,,

SINGLE AND SEMI-DOUBLE ROSES

These Roses have become very popular of late years. Some of them deserve it, but many should be thrown away. Single Roses have unfortunately a brief flowering season. To a small grower this is a consideration; and unless the garden is fairly large, we should advise the novice to leave them alone. Most of them should receive no pruning beyond thinning out the old worn-out wood in autumn.

SOME SINGLE AND SEMI-DOUBLE ROSES.

NAME.	COLOUR.	STOCK.
Altaica	White; large	Own Root
Andersoni	Pink	Manetti
Austrian Copper	Copper	,,
,, Yellow	Yellow	,,
Bardou Job	Crimson and Black	,,
*Carmine Pillar	Carmine	Own Root
Hebe's Lip	White, edged Red	Briar
Janet's Pride	Rose and White	,,
Lady Penzance	Coppery Yellow; Sweet Briar foliage	,,
Leuchtstern	Pink; large White Eye	Own Root
*Macrantha	Blush; large	,,
Meg Merrilies	Crimson; Sweet Briar foliage	,,
Moschata alba	White	,,
*Polyantha grandiflora	Large White	,,
Rugosa	Pink; fine seed-pods	,,
,, alba	Pure White; fine seed-pods	,,
Wichuriana	Small White; creeps on ground like Ivy	,,
,, Jersey Beauty	Yellow Buds, White Flower; runs on ground	,,

Those marked thus * are Ramblers; the others are Bushes or Pillars.

TWENTY DWARF GROWING TEAS FOR GARDEN

VARIETY.	COLOUR.	STOCK.
*Anna Olivier	Salmon Rose	Seedling Briar or Own Root
Comtesse F. Hamilton	Coppery Carmine	,,
Dr. Grill	Coppery Yellow	,,
*Enchantress	Cream	,,
Francisca Kruger	Coppery Yellow	,,
Francis Dubrieul	Crimson	,,
*G. Nabonnand	Rose	,,
*Hon. E. Gifford	Flesh White	,,
Jean Pernet	Bright Yellow	,,
Mme. Falcot	Apricot	,,
*Mme. Hoste	Clear Yellow	,,
*Mme. Lambard	Salmon Pink	,,
*Mme. P. Perny	Saffron	,,
Maman Cochet	Flesh Pink	,,
*Marie d'Orleans	Rose	,,
*Marie Van Houtte	Yellow and White	,,
Princesse A. de Monaco	Creamy Yellow	,,
Souvenir de C. Guillot	Golden Red	,,
*Souvenir de S. A. Prince	Pure White	,,
Viscountess Folkestone	Pink Tinted	,,
White Maman Cochet	White, Tinted Blush	,,

Kinds marked thus * are especially good for bedding.

STRONG GROWING TEAS AND NOISETTES

To grow as large bushes or for pegging down.

VARIETY.	COLOUR.	STOCK.
Belle Lyonnaise	Yellow	Briar or Own Root
Bouquet d'Or	Deep Coppery Yellow	,,
Celine Forestier	Primrose	,,
Climbing Perle des Jardins	Rich Yellow	,,
Dr. Rouges	Reddish Bronze	,,
Gloire de Dijon	Salmon Yellow	,,
Henriette de Beauveau	Bright Yellow	,,
Josephine Bernacchi	Pale Yellow	,,
Kaiserin Friedrich	Yellow, Shaded Pink	,,
L'Ideal	Metallic Red	,,
Mme. B. Levet	Yellow	,,
Mme. Berard	Salmon Rose	,,
Mme. Chauvry	Nankeen	,,
Mme. Jules Siegfried	Cream	,,
Mme. Wagram	Satin Rose	,,
Mme. Moreau	Coppery Yellow	,,
Mme. P. Cochet	Orange	,,
W. A. Richardson	,,	,,

It will be noticed that the majority of kinds in this list are of yellow colours, but all are distinct. They are the best kinds to grow in order to provide a good supply of yellow Roses. Although often planted against walls, they will succeed admirably as bushes by leaving their growths about two feet long when pruning, and bending over the longer shoots as advised in pegging down.

TWENTY TEA ROSES FOR POT CULTURE

VARIETY.	COLOUR.	STOCK.
Anna Olivier	Salmon Rose	Briar or Own Root
Bridesmaid	Bright Pink	,,
Catherine Mermet	Flesh	,,
Etoile de Lyon	Clear Yellow	,,
Golden Gate	Creamy White	,,
Hon. E. Gifford	Flesh White	,,
Jean Ducher	Yellow and Peach	,,
Mme. de Watteville	White, edged Rose	,,
Mme. Falcot	Apricot	,,
Mme. Hoste	Clear Yellow	,,
Mme. Lambard	Salmon Pink	,,
Maman Cochet	Flesh Pink	,,
Marie Van Houtte	Yellowish White	,,
Medea	Fine Yellow	,,
Niphetos	Snow White	,,
Perle des Jardins	Yellow	,,
Sunrise	Apricot, Shaded Carmine	,,
Souvenir d'un Ami	Rose	,,
Sunset	Apricot	,,
The Bride	White	,,

TWENTY-FOUR HYBRID PERPETUALS AS BUSHES OR STANDARDS

VARIETY.	COLOUR.	STOCK FOR DWARFS.
A. K. Williams	Rich Red	Briar
*Alfred Colomb	Light Red	Briar, Manetti, or Own Root
Beauty of Waltham	Cherry Red	,,
*Captain Hayward	Crimson Carmine	,,
Charles Lefebvre	Velvety Crimson	,,
*Clio	Pale Flesh	,,
Comte Raimband	Clear Crimson	,,
*Dr. Andry	Bright Crimson	,,
Duke of Edinburgh	Scarlet Crimson	,,
*Dupuy Jamain	Cerise	,,
Eugene Furst	Velvety Crimson	,,
*Fisher Holmes	Crimson Scarlet	,,
*General Jacqueminot	Scarlet Crimson	Briar or Own Root
Gloire de Margottin	Bright Scarlet Red	,,
*Jeannie Dickson	Silvery Rose	Briar, Manetti, or Own Root
*John Hopper	Rose	,,
Mme. G. Luizet	Silvery Pink	,,
Mme. V. Verdier	Light Crimson	,,
Mlle. M. Finger	Salmon Pink	,,
*Mrs. John Laing	Rosy Pink	,,
*Mrs. Sharman Crawford	,,	,,
Pride of Waltham	Salmon Pink	,,
Prince C. de Rohan	Crimson Maroon	,,
*Ulrich Brunner	Cherry Red	,,

Those kinds marked * are good for bedding.

ROSES FOR SMOKY DISTRICTS, OPEN SPACES NEAR LARGE TOWNS, CEMETERIES, OR WHERE SOIL IS VERY POOR.

Those marked thus * would be especially good kinds to plant in gardens near the sea, and the bushes should be upon their own roots. Kinds marked thus ** are Rambling Roses. Dig the ground deeply before planting; incorporate some manure at same time. If the texture is heavy, add grit, road scrapings, and at all times burnt garden refuse is very valuable to mix in. If the soil be light and sandy, give preference to the Teas, Hybrid Teas, and Chinese, and work in some clayey soil if procurable, failing that a good dressing of cow manure is very helpful, especially if a good layer is put underneath at a depth of about two feet.

NAME.	COLOUR.	CLASS.	STOCK.
Common Moss*	Pink	Moss	Own Root
Baron de Wassanaer	Red	,,	,,
Blairii No. 2	Blush Pink	Hybrid Chinese	,,
Charles Lawson*	Rose	,,	,,
Chenedole	Crimson	,,	,,
Mme. Plantier	White	,,	,,
Paul Ricant	Red	,,	,,
Harrisonii	Yellow	Australian Briar	,,
Hybrid Sweet Briars*	Various	Sweet Briar	,,
Stanwell Perpetual*	Blush	Perpetual Scotch	Briar
La Ville de Bruxelles*	Rose	Damask	Own Root
Mme. Hardy	White	,,	,,
Ruga	Blush	Ayrshire	,,
**Félicité Perpetue	White	,,	,,
**Flora	Pink	Evergreen	,,
Celestial*	Blush Pink	Alba	Own Root or Manetti
Mlle. Legras	White	,,	,,
**Aglaia	Yellow	Polyantha	Own Root or Briar
**Crimson Rambler*	Crimson	,,	,,
Dawson Rose*	Pink	,,	,,
**The Garland	Fawn	Hybrid Musk	Own Root
**Carmine Pillar* (single)	Carmine	Hybrid	Own Root or Manetti
**Grandiflora* (single)	White	Polyantha	Own Root
Clothilde Soupert	Peach & White	,,	Own Root or Briar
Gloire des Polyantha*	Deep Pink	,,	,,
Perle d'Or*	Orange	,,	,,
Blanc Double de Courbet*	White	Rugosa	,,
Rugosa rosea	Rosy Pink	,,	,,
Mrs. A. Waterer	Red	,,	,,
Anna Alexieff	Rose	Hybrid Perpetual	,,
Clio	Blush	,,	,,
Coquette des Blanches	White	,,	,,
John Hopper	Rose Pink	,,	,,
Jules Margottin*	Cherry	,,	Own Root
Dupuy Jamain	Cerise	,,	Own Root or Briar
Gen. Jacqueminot*	Red	,,	,,
Magna Charta*	Deep Pink	,,	,,
Mrs. J. Laing	Pink	,,	,,
Ulrich Brunner*	Red	,,	,,
La France*	Pink	Hybrid Tea	,,
Caroline Testout*	Rich Pink	,,	,,
Cheshunt Hybrid*	Magenta	,,	,,
**Reine Olga de Wurtemburg	Crimson	,,	,,
Camoens	Rose	,,	,,
Grace Darling*	Peach & Yellow	,,	,,

NAME.	COLOUR.	CLASS.	STOCK.
Mlle. Wagram*	Carnation Pink	Hybrid Tea	Own Root or Briar
Gruss an Teplitz	Scarlet	,,	,,
Viscountess Folkestone*.	Pink & Cream	,,	,,
Common China*	Pink	Chinese	Own Root
Armosa*.	Rosy Pink	Bourbon	,,
Souvenir de Malmaison	Blush White	,,	Own Root or Briar
**Aimée Vibert*	White	Noisette	,,
Fellenburg	Red	,,	,,
**Gloire de Dijon*	Cream	Tea	,,
**Waltham Climber, No. 1*	Crimson	,,	,,
**Mme. Alf. Carriere*	Creamy & White	,,	,,
Marie d'Orleans*	Rosy Red	,,	,,
Maman Cochet	Rosy Pink	,,	,,
Enchantress*	Creamy Buff	,,	,,
Marie Van Houtte*	Pale Yellow	,,	,,
Mme. Lambard*	Pink & Red	,,	,,

ROSES AS LARGE BUSHES

Roses that form themselves into huge bushes have their advocates nowadays. We do not advise amateurs to grow them unless they have abundance of space. Such plants are best given a support in the form of a centre stake. Allow them to grow at random, merely removing dead or very old growths. The following varieties form a representative collection :—

NAME.	COLOUR.	CLASS.	STOCK.
Blairii No. 2	Blush Pink	Hybrid Chinese	Own Root
Blanc Double de Courbet	White	Rugosa	Own Root or Briar
Claire Jacquier	Nankeen	Polyantha	,,
Climbing Souvenir de Wootton	Rosy Red	Hybrid Tea	,,
Coquette des Blanches	White	Hybrid Perpetual	,,
Crimson Rambler	Crimson	Multiflora	,,
De la Grifferaie	Rosy Pink	,,	Own Root
Dawn	Blush	Hybrid Tea	Own Root or Briar
Dawson Rose	Pink	Multiflora	,,
Félicité Perpetue	White	Evergreen	Own Root
Fellenberg	Rosy Red	Noisette	,,
Flora	Pink	Evergreen	,,
Gloire de Dijon	Cream	Tea	Own Root or Briar
Longworth Rambler	Cherry Red	Hybrid Tea	,,
Macrantha	Blush	Gallica	,,
Mme. Alfred Carriere	White & Cream	Tea	,,
Mme. Plantier	White	Hybrid Chinese	,,
Magna Charta	Deep Pink	Hybrid Perpetual	,,
Maiden's Blush	Blush	Alba	Own Root
Paul's Single White	White	Noisette	,,
Polyantha Simplex	,,	Multiflora	,,
Reine Olga de Wurtemburg	Crimson	Hybrid Tea	Own Root or Briar
Robusta	Maroon Red	Bourbon	,,
Rugosa rosea	Rose	Rugosa	,,
Souvenir de Mme. Joseph Metral	Cerise	Tea	,,
Ulrich Brunner	Red	Hybrid Perpetual	,,
Waltham Climber No. 1	Crimson	Tea	,,

A FEW OF THE BEST SPECIES OF ROSE

On own roots where possible to procure them.

NAME.	COLOUR.	HABIT.
R. alba	Blush	Bush
,, alpina	Purple; lovely heps	,,
,, canina (this is the dog rose of our hedgerows)	Various	,,
,, ferruginea or rubrifolia	Pink	Bush, mostly grown for its lovely red foliage
,, hispida	Yellow	Bush
,, indica	Pink. This is the type from which Tea Roses have sprung	,,
,, lævigata or Cherokee Rose	White	Wall Climber
,, lucida	Bright Red	Bush
,, lutea	Yellow	,,
,, moschata alba	White and Pink	,,
,, multiflora	White	,,
,, rugosa	Rose	,,
,, setigera, Prairie Rose	Pink, late flowering	,,
,, spinosissima, the single Scotch Rose	Various	,,
,, wichuriana. Many lovely hybrids are now being raised from this species	White	Creeping on the ground like ivy

BUTTON-HOLE ROSES FOR OUTDOOR CULTURE

Only such varieties as produce neat flowers are mentioned. It is now fashionable to wear the large show Tea Roses for button-holes, but the following kinds are the most serviceable:—Common Moss, Blanche Moreau, A. K. Williams, Gloire Lyonnaise, Alfred Colomb, Victor Hugo, Souvenir de Malmaison, Bouquet d'Or, W. A. Richardson, L'Ideal, Gustave Regis, Mme. Berard, Mme. Moreau, Anna Olivier, Catherine Mermet, Francis Dubrieul, Mme. C. Guinoisseau, Mme. Falcot, Mme. Hoste, Mme. P. Perny, Marie Van Houtte, Papa Gontier, Corallina, Souvenir de C. Guillot, Sunrise, Killarney, Mme. Abel Chatenay, Souvenir du President Carnot.

ROSES OF VARIOUS COLOURS AND TINTS

Roses vary so much in colour that classification is difficult. Where space allows, it is always advisable to plant a bed or group of one kind. For instance, if a mass of rich pink were required, far better to plant a kind like Caroline Testout than several varieties approaching it in colour. But as this work is for the beginner, we have given the names of a few of the best varieties of their colour. Those kinds marked ** are very vigorous, and best fitted for large bushes or clusters of beds. Other kinds marked thus * are vigorous.

NAME.	CLASS.	STOCK.
Pure White—		
Niphetos	Tea	Briar or Own Root
*Blanc Double de Courbet	Rugosa	,,
*Baronne de Maynard	Hybrid Perpetual	,,
Souvenir de S. A. Prince	Tea	,,
Anna Marie de Montravel	Polyantha	,,
*Blanche Moreau	Moss	,,
White-Tinted Blush or Lemon—		
The Bride	Tea	Briar or Own Root
Merveille de Lyon	Hybrid Perpetual	,,
*Margaret Dickson	,,	,,
*White Maman Cochet	Tea	,,
*Clio	Hybrid Perpetual	,,
Hon. E. Gifford	Tea	,,
Augustine Guinoisseau	Hybrid Tea	,,
*Gloire Lyonnaise	,,	,,
Souvenir de la Malmaison	Bourbon	,,
White Lady	Hybrid Tea	,,

NAME.	CLASS.	STOCK.
Creamy-White and Buff—		
Muriel Grahame	Tea	Briar or Own Root
Enchantress	,,	,,
Anna Olivier	,,	,,
**Gloire de Dijon	,,	,,
Flesh-Pink—		
Captain Christy	Hybrid Tea	Briar or Own Root
*Clara Watson	,,	,,
*G. Nabonnand	Tea	,,
**Mrs. Paul	Bourbon	,,
Pale Pink—		
Baroness Rothschild	Hybrid Perpetual	Briar or Own Root
*Mme. G. Luizet	,,	,,
Mrs. Cocker	,,	,,
La France	Hybrid Tea	,,
Maman Cochet	Tea	,,
Killarney	Hybrid Tea	,,
*Grace Darling	,,	,,
*Mrs. J. Laing	Hybrid Perpetual	,,
Rosy-Pink—		
Mlle. Marie Finger	Hybrid Perpetual	Briar or Own Root
*Pride of Waltham	,,	,,
*Caroline Testout	Hybrid Tea	,,
Mrs. Sharman Crawford	Hybrid Perpetual	,,
Mrs. W. J. Grant	Hybrid Tea	,,
Bridesmaid	Tea	,,
*Mme. Lambard	,,	,,
*Mme. A. Chatenay	Hybrid Tea	,,
Rose—		
*Jeannie Dickson	Hybrid Perpetual	Briar or Own Root
Marquise de Castellane	,,	,,
Suzanne M. Rodocanachi	,,	,,
*H. Schultheis	,,	,,
Camoens	Hybrid Tea	,,
Mme. J. Grolez	,,	,,
*Mme. Laurette Messimy	China	,,
Cerise—		
Helen Keller	Hybrid Perpetual	Briar or Own Root
*Dupuy Jamain	,,	,,
Light Red—		
*Ulrich Brunner	Hybrid Perpetual	Briar or Own Root
Marie Baumann	,,	,,
Alfred Colomb	,,	,,
Carmine-Rose—		
Marquise Litta	Hybrid Tea	Briar or Own Root
*Mme. Isaac Periere	Hybrid Briar	,,
Marie d'Orleans	Tea	,,
Light Crimson—		
*Mme. V. Verdier	Hybrid Perpetual	Briar or Own Root
A. K. Williams	,,	,,
Waltham Standard	,,	,,
*Ella Gordon	,,	,,
Dr. Andry	,,	,,
Papa Gontier	Tea	,,
Approaching Scarlet—		
*Duke of Edinburgh	Hybrid Perpetual	Briar or Own Root
Duke of Teck	,,	,,
*Gloire de Margottin	,,	,,
*Captain Hayward	,,	,,
**Gruss an Teplitz	Hybrid Tea	,,
Cramoisie Superieure	China	,,
Scarlet-Crimson—		
Eclair	Hybrid Perpetual	Briar or Own Root
Fisher Holmes	,,	,,
*General Jacqueminot	,,	,,
Duke of Albany	,,	,,

NAME.	CLASS.	STOCK.
Scarlet-Crimson—		
Marquise de Salisbury	Hybrid Tea	Briar or Own Root
Princesse de Sagan	Tea	,,
Velvety-Crimson—		
*Charles Lefebvre	Hybrid Perpetual	Briar or Own Root
Victor Hugo	,,	,,
Louis Van Houtte	,,	,,
*Eugene Furst	,,	,,
Maroon and nearly Black—		
Abel Carriere	Hybrid Perpetual	Briar or Own Root
*Prince C. de Rohan	,,	,,
Emperor	,,	,,
Violet or Purple—		
Sir R. Hill	Hybrid Perpetual	Briar or Own Root
Jean Cherpin	,,	,,
Pale Yellow and Cream—		
*Marie Van Houtte	Tea	Briar or Own Root
Mme. Hoste	,,	,,
*Mme. Pernet Ducher	Hybrid Tea	,,
**Belle Lyonnaise	Tea	,,
Mme. C. Kuster	,,	,,
*Kaiserin Aug. Victoria	Hybrid Tea	,,
Straw-Yellow—		
Perle des Jardins	Tea	Briar or Own Root
Lemon-Yellow—		
Medea	Tea	Briar or Own Root
**Celine Forestier	Noisette	,,
Amazone	Tea	,,
Mme. C. Guinoisseau	,,	,,
Golden-Yellow—		
**Marechal Niel	Noisette	Briar or Own Root
*Mme. Eugene Verdier	Tea	,,
Pure Yellow—		
**Henriette de Beauveau	Tea	Briar or Own Root
Orange and Orange-Scarlet—		
**W. A. Richardson	Noisette	Briar or Own Root
*Mme. Pierre Cochet	,,	,,
Souvenir de C. Guillot	Tea	,,
Mme. Rene Gerard	,,	,,
Ma Capucine	,,	,,
Apricot-shaded—		
*Safrano	Tea	Briar or Own Root
Mme. Falcot	,,	,,
*Francisca Kruger	,,	,,
Queen Mab	China	,,
Nankeen-Yellow—		
*Gustave Regis	Hybrid Tea	Briar or Own Root
Perle d'Or	Polyantha	,,
Coppery-Red and Coppery-Rose—		
*L'Ideal	Noisette	Briar or Own Root
Mme. E. Resal	China	,,
Souvenir de J. B. Guillot	Tea	,,
*Empress Alexandra of Russia	,,	,,
Rosy-Flesh, Pink, or Cream, with Yellow or Orange Base—		
Mme. Cadeau Ramey	Hybrid Tea	Briar or Own Root
Antoine Rivoire	,,	,,
Mme. E. Boullet	,,	,,
Ferdinand Batel	,,	,,
Mme. Lucien Duranthon	Tea	,,
Striped Roses—		
Rosa Mundi, or York and Lancaster	Damask	Briar or Own Root
Pride of Reigate	Hybrid Perpetual	,,
Rainbow	Tea	,,

HEDGE ROSES

For this purpose we would advise the following :—

NAME.	COLOUR.	CLASS.	STOCK.
Félicité Perpetue	White	Sempervirens	Own Root
Flora	Pink	,,	,,
Virginian Rambler	Blush	Ayrshire	,,
Crimson Rambler	Crimson	Multiflora	,,
Aglaia	Yellow	,,	,,
Euphrosyne	Pink	,,	,,
The Garland	Buff	Hybrid Musk	,,
Jersey Beauty	Creamy White, Single	Hybrid Wichuriana	Briar or Own Root
Evergreen Gem	Yellow & White	,,	,,
Ruby Queen	Crimson	,,	,,
Reine Olga de Wurtemburg	,,	Hybrid Tea	,,
Mme. Alfred Carrière	Creamy White	,,	,,
Penzance Briars	Various	Sweet Briar	,,
Robusta	Crimson	Bourbon	,,
Pink Roamer	Pink	Hybrid Wichuriana	,,
Carmine Pillar	Carmine	Hybrid Tea	,,
Gloire de Dijon	Buff	,,	,,
Mme. Berard	Salmon Rose and Yellow	,,	,,
Reine Marie Henriette	Red	,,	,,

A moderately high hedge could be formed on the same lines as above with the following kinds :—

NAME.	COLOUR.	CLASS.	STOCK.
De la Grifferaie	Pink	Multiflora	Own Root
Longworth Rambler	Cherry Red	Noisette	Own Root or Briar
Mme. G. Bruant	White	Rugosa	,,
Blanc Double de Courbet	,,	,,	,,
Mrs. A. Waterer	Crimson	,,	,,
Cheshunt Hybrid	Magenta	Hybrid Tea	,,
Harrisonii	Yellow	Austrian Briar	,,
Common China	Blush	China	,,
Armosa	Pink	Bourbon	,,
Mme. Plantier	White	Hybrid Noisette	,,
Aimée Vibert	,,	Noisette	,,
Charles Lawson	Rose	Hybrid China	,,
Waltham Climber No. 1	Crimson	Tea	,,
Stanwell Perpetual	Blush	Hybrid Scotch	,,
Maiden's Blush	,,	Alba	,,
Celestial	Pink	,,	,,
Alister Stella Gray	Orange	Noisette	,,
Gruss an Teplitz	Scarlet	Hybrid Tea	,,
Dawson Rose	Pink	,,	,,
Macrantha	Blush	Gallica	,,
Hebe's Lip	White, edged Rose	,,	,,
Fellenberg	Cherry Red	Noisette	,,
Ulrich Brunner	Light Red	Hybrid Perpetual	,,
Mme. G. Luizet	Pale Pink	,,	,,
Ella Gordon	Crimson	,,	,,
Mrs. J. Laing	Pale Pink	,,	,,
Magna Charta	Deep Rose	,,	,,

When a low hedge is required around lawn tennis ground or such like places, the following are very useful kinds:—

NAME.	COLOUR.	CLASS.	STOCK.
Scotch Roses	Various	Scotch	Own Root
Common Moss	Pink	Moss	,,
Mme. L. Messimy	Rosy Pink	China	Own Root or Briar
Mrs. Bosanquet	Buff	,,	,,
Marie Van Houtte	Cream	Tea	,,
Mme. Lambard	Pink	,,	,,
Cameons	Deep Rose	Hybrid Tea	,,
Viscountess Folkestone	Creamy White	,,	,,
Anna Olivier	Buff	Tea	,,
Mme. Hoste	Cream	,,	,,
Marie d'Orleans	Rose	,,	,,
Corallina	Coral Red	,,	,,
Enchantress	Cream	,,	,,
Mme. Wagram	Carnation	,,	,,
Mme. Abel Chatenay	Vermilion Pink	Hybrid Tea	,,
Perle d'Or	Nankeen	Polyantha	,,
Gloire des Polyantha	Rose	,,	,,
Cecile Brunner	White & Flesh	,,	,,

VERY FRAGRANT ROSES

NAME.	COLOUR.	CLASS.	STOCK.
Common Provence or Cabbage Rose	Pink	Provence	Manetti
Charles Lawson	Rose	Hybrid Chinese	Own Root
Crested Provence	Pink	Provence	Manetti
Kakanlyk	,,	,,	,,
Note.—This rose is grown in Bulgaria for Otto of Roses.			
Baron de Bonstetten	Maroon	Hybrid Perpetual	Own Root or Briar
A. K. Williams	Crimson	,,	,,
Charles Lefebvre	Dark Crimson	,,	,,
General Jacqueminot	Red	,,	,,
Senateur Vaisse	Rich Red	,,	,,
Beauty of Waltham	Cherry	,,	,,
Wm. Warden	Deep Pink	,,	,,
Alfred Colomb	Bright Red	,,	,,
Dr. Andry	Rich Red	,,	,,
Augustine Guinoisseau	Pinky White	Hybrid Tea	,,
La France	Silvery Pink	,,	,,
Fisher Holmes	Crimson	Hybrid Perpetual	,,
Crimson Queen	,,	,,	,,
Louis Van Houtte	Deep Crimson	,,	,,
Heinrich Schultheis	Rosy Pink	,,	,,
Emperor	Blackish Crimson	,,	,,
Magna Charta	Deep Pink	,,	,,
La Rosière	Rich Maroon	,,	,,
Mrs. John Laing	Pink	,,	,,
Ulrich Brunner	Red	,,	,,
Duchess of Albany	Deep Pink	Hybrid Tea	,,
Marie Baumaun	Red	Hybrid Perpetual	,,
Pierre Notting	Maroon	,,	,,
Maurice Bernardin	Blackish Crimson	,,	,,

NAME.	COLOUR.	CLASS.	STOCK.
E. Y. Teas	Red	Hybrid Perpetual	Own Root or Briar
Prince Arthur	,,	,,	,,
Preciosa	Light Red	,,	,,
L'Ideal	Bronzy Red	Noisette	,,
Devoniensis	Blush	Tea	,,
Gloire de Dijon	Cream	,,	,,
Goubault	Pink	,,	,,
Mme. de St. Joseph	,,	,,	,,
Marechal Niel	Yellow	Noisette	,,
Luciole	Pink & Apricot	Tea	,,
Viscountess Folkestone	Creamy Pink	Hybrid Tea	,,
W. F. Bennett	Purplish Red	,,	,,
Souvenir d'un Ami	Pink	Tea	,,
Meta	Crushed Strawberry	,,	,,
Beauté Inconstante	Metallic Red	,,	,,
Mme. Abel Chatenay	Vermilion Rose	Hybrid Tea	,,
Princess Bonnie	Rosy Red	,,	,,
Pink Rover	Pink	,,	,,
Papa Lambert	Rich Rose	,,	,,
Mme. de Watteville	Blush and Pink	Tea	,,
Countess of Pembroke	Rose	Hybrid Tea	,,
Kaiserin Friedrich	Cream and Pink	Tea	,,

DWARF ROSES FOR PIT OR HOUSE CULTURE

NAME.	COLOUR.	STOCK.
Anna Olivier	Cream and Buff	Briar
Camoens	Rosy Pink	,,
Captain Hayward	Crimson Scarlet	Briar or Manetti
Caroline Testout	Rich Pink	Briar
Enchantress	Cream	,,
Fisher Holmes	Rich Red	,,
General Jacqueminot	Red	Briar, Manetti or Own Root
La France	Silvery Pink	,,
Mme. Hoste	Pale Yellow	Briar
Mme. Lambard	Rosy Salmon	,,
Marquise Litta	Vermilion Rose	,,
Marie Van Houtte	Pale Yellow	,,
Mrs. J. Laing	Pink	Briar or Manetti
Mrs. W. J. Grant	Imperial Pink	Briar
Souvenir de S. A. Prince	White	,,
Ulrich Brunner	Light Red	Briar or Manetti
White Lady	Pinkish White	Briar

AN AMATEUR ROSE-GROWER'S SELECTION

It will interest beginners to know that the following list of Roses was compiled by Mr. Molyneux, an enthusiastic Rose-grower at Balham, near London, and Mr. E. Mawley, the secretary of the National Rose Society :—

Hybrid Perpetuals.—Pink: Mrs. R. G. Sharman Crawford. Crimson: Prince C. de Rohan, Fisher Holmes.

Hybrid Teas.—White or pale-flesh: Viscountess Folkestone, Augustine Guinoisseau, Souvenir du President Carnot, Kaiserin A. Victoria, Marjorie, Souvenir de Mme. E.

Verdier, Gloire Lyonnaise, Antoine Rivoire, Bessie Brown, Clara Watson. Pink: La France, Caroline Testout, Mrs. W. J. Grant, Mme. Abel Chatenay, Grace Darling, Killarney, Camoens, Grand Duc de Luxembourg. Rose: Marquise Litta, Mme. Jules Grolez. Crimson: Grüss an Teplitz, Marquise de Salisbury, Duchess of Edinburgh, Bardou Job, Liberty. Yellow and orange: Gustave Regis, Mme. Pernet Ducher, Mme. Eugénie Boullet, Papa Gontier,

Teas.—White: Hon. E. Gifford, White Maman Cochet, Souvenir de S. A. Prince. Pink: Maman Cochet, Anna Chartron, Dr. Grill, Mme. Lambard, Mrs. E. Mawley. Crimson: Princesse de Sagan, Souvenir de T. Levet, Corallina. Yellow and orange: Mme. Hoste, Anna Olivier, Souvenir de C. Guillot, Souvenir de J. B. Guillot, Mme. E. Verdier, Beauté Inconstante, Marie Van Houtte, L'Idéal.

Bourbon.—White: Souvenir de la Malmaison.

Chinas.—Pink: Mme. Eugène Résal, Laurette Messimy, Common Monthly, Queen Mab. Crimson: Cramoisie Supérieure.

Polyantha.—White: Mme. Anna, M. de Montravel. Pink: Gloire des Polyanthas. Yellow: Perle d'Or.

Rugosa.—White: Blanc Double de Coubert, Mme. G. Bruant, Fimbriata.

Wichuriana.—White: Wichuriana. Pink: Jersey Beauty.

Climbing and Pillar Roses.—White: Mme. A. Carrière, Aimée Vibert, Bennett's Seedling (s), *Rosa moschata alba* (s), *Rosa himalaica* (s), *Rosa macrantha* (s), The Garland (s). Pink: Papillon. Crimson: Reine Marie Henriette, Crimson Rambler (s), Longworth Rambler, Ard's Rover, Reine Olga de Wurtemburg, Paul's Carmine Pillar (s). Yellow: W. A. Richardson, Gloire de Dijon, Alister Stella Gray, Claire Jacquier, Reve d'Or.

N.B.—Each of the only summer-flowering varieties is indicated by an "s" in brackets after the name.

Hedges.—Penzance Sweet Briars.

CHRYSANTHEMUMS

SELECTIONS FOR VARIOUS PURPOSES

Twenty-four Japanese Kinds for Exhibition.—Mme. Carnot, white; Mrs. W. Mease, sulphur-yellow; Mrs. Barkley, soft rosy-mauve, silvery reverse; Mrs. Coombes, soft rose-pink; G. J. Warren, rich canary-yellow; J. R. Upton, bright golden-yellow; Lady Hankam, rosy-cerise on chamois ground; Viviand Morel, silvery rosy-mauve; Chas. Davis, bronze; Phœbus, rich yellow; Jane Molyneux, pure white; Miss Alice Byron, pure white; Lord Ludlow, golden-yellow, tinted crimson; Mrs. G. W. Palmer, crimson-bronze; Edwin Molyneux, deep rich crimson, golden reverse; Mutual Friend, pure white; Mme. Von André, primrose; Mons. Chevon de Léche, salmon-red; Pride of Madford, deep rich purple; Australia, purple-rosy, silvery-white reverse; Calvat's '99, pale blush; Lionel Humphrey, rich chestnut, golden reverse; Le Grand Dragon, orange-yellow; and Mrs. White Popham, white, shaded purple.

Twelve Japanese Kinds for Decorations.—Vivid, chestnut-red, yellow reverse; Mlle. Lacroix, pure white; Annie Clibran, soft rose-pink; Klondike, rich yellow; Source d'Or, rich orange-red; William Holmes, richest crimson, bronze reverse; Clinton Chalfont, rich golden-yellow; Etoile de Feu, bright orange-red; Lady Selborne, white; James Salter, mauve-pink; Western King, pure glistening white; and Mr. Chas. E. Shea, canary-yellow.

Six Thread-Petalled and other Fantastic Flowers.—Mrs. James Carter, pale yellow; Alice Carter, reddish-crimson, tipped gold; Golden Shower, golden-yellow, passing to crimson at ends of petals; Bouqueterre, white, tipped yellow and rose; Mrs. Wm. Filkins, yellow; and Mrs. W. Butters, white. The first four are thread-petalled varieties.

Eighteen Incurved Kinds for Exhibition.—Hanwell Glory, bright bronze; Mrs. H. J. Jones, white; Duchess of Fife, pure white; Henry Ellis, creamy-white; Chas. H. Curtis, yellow; Mrs. W. Howe, golden-amber; Lady Isabel, blush-lavender; Mrs. W. C. Egan, light pink, shading to white; Madame Ferlat, white; Topaze Oriental, straw-yellow; Globe d'Or, bronzy-yellow; Miss Violet Foster, silvery-rose; Chrysantheme Bruant, rosy-buff; Mrs. R. C. Kingston, soft lilac-pink; Mrs. Gerald Williams, bright yellow; George Haigh, carmine-rose, shaded golden-bronze; Matthew Russell, deep rich bronze; and Mons. Desblanc, rich buff, shaded yellow.

Four Incurved Sorts for Decorations.—Mrs. George Rundle, white; George Glenny, pale canary-yellow; Golden George Glenny, golden-yellow; and Mr. Bunn, bright deep yellow.

Six Reflexed.—Cullingfordi, bright crimson; Pink Christine, light pink; King of Crimsons, deep crimson; Peach Christine, peach-pink; White Christine, white; and Golden Christine, golden-bronze.

Six Large Anemones.—Descartes, rich reddish-chestnut; Cincinnatti, blush pink, lighter centre; Mrs. Judge Benedict, sulphur, tinted blush; Madame Robt. Owen, pure white; Gluck, orange-yellow; and Delaware, creamy-white.

Twelve Large-Flowered Japanese Anemones.—John Bunyan, rich yellow; W. W. Astor, salmon-blush, golden rose centre; Sir Walter Raleigh, pale blush, centre lilac, tipped yellow; Enterprise, rose, sulphur centre; Nelson, crimson-purple; Mrs. Hugh H. Gardiner, deep rose, high disc, tipped gold; Marcia Jones, pure white; Mlle. Cabrol, rose-pink, lilac disc; Queen Elizabeth, silvery blush, rose centre, tipped yellow; Robert Burns, blush, creamy-yellow centre; Chalonais, citron-yellow; and Fabian de Mediana, white, shaded purple, lilac centre.

Six Pompon Anemones.—Antonius, bright yellow; Emily Rowbottom, bluish-white; Marie Stuart, blush, sulphur centre; Madame Chalonge, blush, tipped sulphur; Calliope, ruby-red; Regulus, cinnamon-brown; and Magenta King, magenta, centre yellow.

Six Pompons.—William Westlake, rich golden-yellow; William Kennedy, crimson amaranth; Mlle. Elise Dordan, silvery-pink; Rosinante, blush-rose; Comte de Morny, purple; and Osiris, rosy-pink, tipped gold.

Six Miniature-Flowered Pompons.—Snowdrop, pure white; Primrose League, pale canary-yellow; Miss Gertie Waterer, pale flesh-pink; Lune Fleurie, very small blossoms; Model of Perfection, lilac, edged white; and Victorine, dark brown.

Six Large-Flowered Singles.—Framfield Beauty, velvety-crimson; Eucharis, purest white; Purity, white; Kate Williams, yellow, flushed terra-cotta; Earlswood Beauty, blush; and Victoria, creamy-primrose.

Six Small-Flowered Singles.—Mary Anderson, pale blush; Mrs. D. B. Crane, cerise-pink; Emily Wells, clear pink; Annie Tweed, bright crimson; Miss Annie Holden, straw-yellow; and Gladys Foster, white, with yellow disc.

EARLY-FLOWERING CHRYSANTHEMUMS.

Twelve Pompons for Outdoor Culture.—Mr. Selby, rosy-lilac; Little Bob, bright chestnut-crimson; L'Ami Conderchet, pale yellow; Yellow L'Ami Conderchet, rich golden-yellow; Blushing Bride, rose-lilac; Bronze Bride, bronzy-rose; Alice Butcher, orange-red; Lyon, rosy-purple; Mrs. Cullingford, white; Miss Davis, blush-pink; Madame Ed. Lefort, bright orange, tinted red; and Mme. Jollivart, blush-white.

Twenty-Four Japanese Varieties for Outdoors.—François Veillermet, lilac-rose; Harvest Home, crimson and gold; Madame Marie Masse, lilac-mauve; Crimson Marie Masse, pale chestnut-crimson; Ralph Curtis, cream; Mme. Eulalie Morel, deep cerise, golden centre; Mme. Casimir-Perier, white, tinted pink; Mrs. Geo. Hill, primrose, richer centre; Mychett White, white; Market White, white; Notaire Groz, pleasing mauve-pink; Sam Barlow, bright salmon-pink; Ambroise Thomas, reddish bronze; Mme. la Comtesse Foucher de Cariel, reddish orange; Crimson Pride, deep crimson; Edie Wright, pink; Ivy Stark, orange-yellow; Mme. Desgranges, white; George Wermig, rich yellow; Queen of the Earlies, white; Golden Queen of the Earlies, rich yellow; Ryecroft Glory, bronzy-yellow; and Roi des Précoces, deep rich crimson.

TUFTED PANSIES (VIOLAS).

Twelve Good Self-Coloured Sorts, Rayless.—Blanche, creamy-white; White Beauty, pure white; Niobe, purest white; Nellie Riding, golden-yellow; Pembroke, canary-yellow; Marguerite, primrose; Florizel, blush-lilac; Rosea Pallida, blush-rose; Blue Gown, mauve, tinted blue; King of the Blues, deep rich blue; Devonshire Cream, rich cream; and Ophelia, purple-heliotrope.

Twelve Fancy and Margined Sorts.—Duchess of Fife, primrose, edged blue; Goldfinch, deeper yellow, edged purplish-blue; Lark, white, edged blue; Border Witch, edged and shaded blue on white ground; Acme, rich purplish-crimson; Mrs. C. F. Gordon, alternately blotched purplish-violet and white; Stobhill Gem, lower petals violet, upper ones bluish-white; Cottage Maid, blotched violet and white; Hawk, an improvement on Lark regarding colour; Isa Fergusson, lower petals glossy-black, deep blue blotch on each petal; Butterfly, white, edged deep rose; and Mrs. H. J. Jones, shaded blue on white ground.

Twelve Good Self-Coloured Sorts, Rayed.—Ardwell Gem, sulphur-yellow; Mrs. A. H. Beadles, pure white; Councillor W. Waters, crimson-purple; Endymion, pale yellow; J. B. Riding, deep mauve; Kitty Bell, blush-lavender; Lizzie Paul, deep rich yellow; Stephen, rich yellow; True Blue, imperial blue; William Niel, pale rose-pink; Lord Salisbury, pale primrose; and Maggie, rosy-pink.

Twelve Pansies for Exhibition.—Jessie Cottee, rich canary yellow, deeper-coloured tip, rayless; Mrs. A. H. Beadles, rayed, pure white; Nellie Riding, rayless, golden-yellow; Thrasher, rayless, heliotrope-blue: Prometheus, rayed, golden yellow; Edward Mason, rayless, pure white; Leda, white, margined pale blue; Yellow Prince, canary-yellow, neatly rayed; Lark, white, edged blue, rayed; Maggie, rosy-pink, rayed; Blanche, creamy-white; and Mrs. C. F. Gordon, blotched purplish-violet and white, rayed.

Six Miniature-Flowered Sorts.—King of the Blues, deep, red-blue; Violetta, pure white; Gold Crest, golden-yellow; Queen of the Year, china-blue; Minnie Warren, blue-lavender; and Walter B. Child, white, margined bluish-lavender.

FRUIT

DESSERT APPLES

VARIETY.	SEASON.	STOCK.	REMARKS.
Irish Peach . . .	August	Paradise	A beautiful fruit; one of the best early apples; must be eaten soon after it is gathered.
Devonshire Quarrenden .	August	Paradise or Crab	A very hardy variety; fruit rather small, dark red; the tree bears well either as a pyramid or as a standard.
Worcester Pearmain . .	September	Paradise or Crab	Handsome fruit of fair quality; a heavy cropper; succeeds well in orchards.
Margil	November to January	Paradise	A finely flavoured dessert apple, somewhat small; does not grow vigorously, therefore suitable for espaliers and dwarf bushes.
Ribston Pippin . . .	November to January	Paradise	A splendid dessert apple; somewhat liable to canker, however, in soil that is at all wet.
King of the Pippins . .	November to January	Paradise	An excellent fruit, with rather an acid flavour; a prolific bearer.
Adam's Pearmain . .	December and January	Paradise	Medium-sized fruit, well flavoured; the tree is a good bearer.
Cox's Orange Pippin . .	November to January	Paradise	Generally recognised as the best flavoured apple in cultivation; bears well either as a standard or pyramid.
Scarlet Nonpareil . .	January to March	Paradise or Crab	Medium-sized, well-coloured fruit; first-rate flavour.
Blenheim Orange . .	November to January	Paradise	A valuable apple, suitable either for dessert or cooking; forms a fine standard tree on the Crab stock, but does not then bear well when young; on the Paradise it bears earlier.
Allington Pippin . .	November to February	Paradise or Crab	A splendid dessert apple; delicious flavour; bears well.
Cockle Pippin . . .	February to April	Paradise or Crab	A valuable late apple of excellent flavour.
Sturmer Pippin . . .	March to May	Paradise or Crab	Another very valuable late apple; delicious flavour; prolific bearer.

COOKING APPLES

VARIETY.	SEASON.	STOCK.	REMARKS.
Frogmore Prolific . .	September and October	Crab or Paradise	An excellent cooking apple; bears well as a standard or pyramid; white juicy flesh; large.
Lord Grosvenor . .	August and September	Crab or Paradise	Large; a splendid early apple, very prolific.
Ecklinville	September and October	Crab or Paradise	A very good apple; heavy bearer; does well in any form, particularly as a pyramid.
Peasgood's Nonsuch . .	October and November	Paradise or Crab	Very large and extremely handsome; good flavour, and fairly prolific.
Warner's King . . .	October to December	Paradise	A hardy and prolific variety; large, excellent kitchen apple.
Cox's Pomona . . .	October and November	Paradise	Large, handsome fruit; a valuable kitchen variety.
Lane's Prince Albert . .	October to February	Paradise	A valuable, large pale-coloured apple; as a bush bears particularly well.
Sandringham . . .	December to March	Paradise or Crab	One of the best kitchen apples; large and handsome; bears well in either stock.
Wellington (Dumelow's Seedling)	November to March	Paradise or Crab	A very valuable cooking apple; keeps well, and is an abundant bearer.
Bramley's Seedling . .	January to March	Paradise	Large and excellent late cooking apple.
Mère de Ménage . .	December to March	Paradise	Finely coloured fruit; bears well as a small bush.

DESSERT PEARS

VARIETY.	SEASON.	STOCK.	REMARKS.
Doyenné d'Eté . . .	July and August	Quince	Small, very good early pear; must be eaten as soon as ripe; will not keep.
Citron des Carmes . .	July and August	Quince	A small, juicy, and well-flavoured early pear that will not keep when ripe.
Beurré Giffard . . .	August	Quince	Medium size; an excellent late summer fruit.
Jargonelle	August	Quince	Large; of rich flavour; succeeds well as a standard; does not keep.
William's Bon Chrétien .	September	Quince	A delicious pear, but will not keep long when ripe.
Fondante d'Automne. .	September and October	Quince or Pear	A deliciously flavoured pear, with white, tender, juicy flesh.
Louise Bonne of Jersey .	September and October	Quince	A very fine fruit of excellent flavour; bears well in any form.
Marie Louise . . .	October and November	Should be double grafted Quince	Richly flavoured, though somewhat uncertain bearer; does well against a wall.
Doyenné du Comice . .	November and December		By many considered to be the best pear in cultivation; fruit large, pale yellow; flesh very rich and sweet.

VARIETY.	SEASON.	STOCK.	REMARKS.
Glou Morceau . . .	December	Quince	A late pear of excellent flavour; grows well on the Quince; should have wall protection if possible, or a sheltered situation.
Winter Nelis . . .	December and January	Quince	A somewhat small fruit, but finely flavoured; a very valuable late variety.
Thompson's . . .	November	Pear	Generally considered to be the best-flavoured pear in cultivation; medium size, of rather uneven shape; exquisite flavour.
Ne Plus Meuris . . .	January and February	Quince	A valuable late variety; medium-sized fruit of first-rate quality.
Olivier de Serres . .	February and March	Quince	An excellent late pear; medium sized, delicious fruit; bears well.
Easter Beurré . . .	January to March	Pear or Quince	Large, juicy fruit, rich flavour; the tree is hardy and bears well on either stock.

COOKING PEARS

VARIETY.	SEASON.	STOCK.	REMARKS.
Catillac	December to April	Quince	Very large fruit, therefore should be grown as a dwarf, and in a somewhat sheltered position; the best for culinary purposes.
Uvedale's St. Germain .	January to April	Quince	Exceedingly large fruit; this variety succeeds particularly well as a cordon; a good stewing pear.
Vicar of Winkfield . .	November to January	Pear or Quince	Fruit long, narrow; does well as a pyramid; of good flavour.

DESSERT PLUMS

VARIETY.	SEASON.	STOCK.	REMARKS.
Early Favourite . . .	July	Common Plum	A valuable early purple plum.
Denniston's Superb . .	August	Common Plum	Yellowish green fruit, over medium size, of splendid flavour; one of the best.
Green Gage . . .	August	Mussel	Preferred by many to any other plum; medium size, rich flavour.
Jefferson	September	Common Plum	Prolific bearer; a most delicious plum; large, oval; rich golden-yellow, with red dots.
Kirke's	September	St. Julian	Dark purple, medium size, of excellent flavour; the tree bears well.

VARIETY.	SEASON.	STOCK.	REMARKS.
Lawson's Golden Gage .	September	Mussel	A highly flavoured fruit; oval, medium size; deep yellow, speckled with crimson.
Reine Claude de Bavay .	September	Mussel	A deliciously flavoured plum; roundish, greenish yellow; large.
Transparent Gage . .	September	Common Plum	Rather large; greenish yellow; marked with red; one of the best.
Coe's Golden Drop . .	Late September	Mussel	Large fruit of splendid flavour; should be allowed to hang late.
Ickworth Imperatrice. .	October	Common Plum	Purple; rich flavour; must hang late also to develop its full flavour.
Nouvelle de Dorelle . .	October	Mussel	Dark purple; a very sweet, late plum.

COOKING PLUMS

VARIETY.	SEASON.	STOCK.	REMARKS.
Duke of Edinburgh . .	August	Mussel	Good bearer; large fruit; light purple colour.
Pond's Seedling . .	September	Common Plum	A large dark red plum, valuable for cooking purposes.
Washington . . .	September	Common Plum	An excellent culinary plum, vigorous grower, and good bearer; large, handsome fruits; yellow, with red markings.
Magnum bonum (red and white)	September	Common Plum	Large and very useful cooking varieties.
Victoria	September	Common Plum	Very heavy bearer; bright red; one of the best culinary plums.

PEACHES

VARIETY.	SEASON.	REMARKS.
Waterloo	July	A valuable early variety, well flavoured.
Hale's Early . . .	Early August	A handsome early peach.
Dymond	August	An excellent fruit, large, and of fine flavour.
Grosse Mignonne . .	Early September	Large; one of the best peaches.
Stirling Castle . . .	September	By many considered to be the sweetest of all peaches; richly flavoured; forces well.
Princess of Wales . .	Late September	A handsome fruit; one of the best.
Violette Hative . . .	September	A rather large fruit; finely flavoured; prolific bearer.
Walburton Admirable .	October	Very large, pale colour; a good late peach.
Sea Eagle	Late September	A finely flavoured large late peach.
Salway	October	An excellent late peach, with yellow flesh.

NECTARINES

VARIETY.	SEASON.	REMARKS.
Early Rivers	Early August	A splendid early Nectarine of first-class flavour; forces very well.
Elruge	Late August	Rather small; handsome fruit; the tree is a prolific bearer.
Lord Napier	Early August	Large, delicious Nectarine; forces well.
Pine Apple	Early September	A very handsome fruit, with yellow flesh, and of good flavour.
Victoria	Late September	A fine late variety; large; pale coloured; bears remarkably well.

All the above Peaches and Nectarines are of good constitution and standard varieties.

CHERRIES

VARIETY.	SEASON.	REMARKS.
Early Rivers	June	A sweet and early cherry; black.
Belle d'Orleans	June	Rich flavour; of a pale yellow colour.
May Duke	July	One of the best cherries; rather acid flavour; dark red colour; an abundant bearer.
Frogmore Early Bigarreau	Early July	A large juicy fruit; yellow, marked with red; prolific.
Knight's Early Black	Late June	A large, black, juicy fruit; grows and bears well
Governor Wood	July	One of the most delicious cherries; pale colour.
Late Duke	Late August	A good late variety; somewhat acid flavour.
Morello	August	Large; very dark red; the best cherry for cooking; does particularly well against a north wall.

STRAWBERRIES

VARIETY.	SEASON.	REMARKS.
Noble	Very early	Very poor flavour; valuable for its earliness.
Keen's Seedling	Early	Dark colour; medium size; prolific; sweet.
La Grosse Sucrée	Early	An excellent variety; dark, shining red; splendid flavour; one of the best.
Royal Sovereign	Early	A large, handsome, scarlet fruit, of good flavour; the best for pot culture.

VARIETY.	SEASON.	REMARKS.
British Queen	Mid-season	Generally considered to be the best flavoured strawberry in cultivation; somewhat tender constitution and shy-fruiting.
Countess	Mid-season	A large conical-shaped fruit; crimson; rich flavour.
Aromatic	Mid-season	Large fruit, with a distinct flavour; prolific bearer.
Lord Suffield	Mid-season	Handsome; dark crimson; of good flavour.
A. F. Barron	Late	A large and valuable late variety; light scarlet.
Veitch's Perfection	Late	Large; very sweet; of good constitution.
Waterloo	Late	An excellent late variety; very dark, almost black when fully ripe; rich flavour.
Dr. Hogg	Late	Large; of as delicious a flavour as British Queen, and of more vigorous constitution.

GOOSEBERRIES

VARIETY.	SEASON.	REMARKS.
Whinham's Industry	Mid-season	Large; of fair flavour; good for picking green.
Speedwell	Early	Fine flavour; large; a good exhibition variety.
Warrington	Late	Above medium size; very fine flavour; good cropper; and valuable for its long-keeping properties.
Red Champagne	Mid-season	Medium size; good colour; upright habit; an excellent bearer of first-rate flavour.
Langley Beauty	Mid-season	A new variety of great excellence; fruit large, of fine flavour and appearance; free habit.
Pretty Boy	Late	A rounded variety; bears well; is of good flavour; and hangs until late in the season.
Keepsake	Early	Large; of fine flavour; very useful from the fruit being large enough to thin for tarts early in the season.
Telegraph	Late	Very large; well flavoured; good bearer; an exhibition variety.
Whitesmith	Late	Medium size; a very free bearer; fine flavour.

RASPBERRIES

VARIETY.	REMARKS.
Superlative	Very large; of excellent flavour; a strong grower, succeeding in soils where other varieties often fail; valuable from its often producing a second crop late in summer and early autumn.
Hornet	Large; of very fine flavour; a good variety in rich soil.
Northumberland Fillbasket	Large; well flavoured; free growing; suitable for preserving.
Baumforth's Seedling	Large; good flavour; bears well, but requires a good soil.
Yellow Antwerp	Generally considered to be the best yellow; large; fine flavour.

AUTUMN FRUITING RASPBERRIES

VARIETY.	REMARKS.
Belle de Fontenay	Late; dark red; very free; bears well.
October Yellow	Excellent flavour; but requires a fine autumn to ripen well.

BLACK CURRANTS

VARIETY.	SEASON.	REMARKS.
Lee's Prolific	Rather early	Large; very sweet and good; one of the best.
Black Naples	Rather early	Very large and sweet; a good bearer
Carter's Champion	...	Very large; good flavour; and keeps well.
Ogden's	...	Very large and good; succeeds where others fail.

WHITE CURRANTS

VARIETY.	SEASON.	REMARKS.
White Dutch	...	Berries and bunches long; good flavour; good bearer.
Transparent Versailles	Late	Very fine flavour; large and good.

RED CURRANTS

VARIETY.	SEASON.	REMARKS.
Cherry	Early	Very large; extra fine.
Red Dutch	Mid-season	Large; very heavy bearer.
Mammoth	Late	Very large and good.
La Constante	Late	Large; good flavour; bears freely; the fruits will hang on the bushes until late autumn.

VEGETABLES

What to Sow.	Dates for Sowing.	Varieties.	Season.
Asparagus	April	Giant	April to July
,, to plant	March or April	Conover's Colossal	,,
Artichoke	,,	...	,,
,, to plant	May	Globe	June to October
,, Jerusalem	March or April	White (Sutton) Old Red	October to April
Beans, dwarf	April	Progress or Ne Plus Ultra	June
,,	May	Magnum Bonum	July
,,	June	Canadian Wonder	August
,,	July	Syon House	September
Beans, runner	May or June	Scarlet Champion, Tender and True, Epicure, or Excelsior	July to October
Beans, broad	February	Early Green Longpod	June
,,	March	Monarch	July
,,	April	Windsor	August
Broccoli	March	Self-Protecting	October
,,	,,	Michaelmas White	November
,,	April	Main Crop	Jan. and Feb.
,,	May	Model or Late Queen	March and April
,,	,,	June Monarch	May
Brussels Sprouts	March or April	Paragon	Oct. to Dec.
,,	,,	Other Varieties	Dec. to March
Beet	April	Crimson Ball or Globe	June to October
,,	May	Nutting's Dwarf Red	Oct. to Dec.
,,	,,	Cheltenham Green Top	Dec. to April
Borecole or Kales	April	Dwarf Curled	Oct. to Dec.
,, ,,	,,	Cottager's, or Late Scotch	Dec. to March
,, ,,	,,	Read's Hearting	Dec. to April
Cabbage	February	Sutton's Maincrop	July
,,	March	Matchless	August
,,	July	Ellam's Dwarf	April
,,	July or August	Rosette Colewort	Oct. to Jan.
Carrots	March	Early Nantes	June
,,	,,	Early Gem	July
,,	April	Matchless or Model	July to October
,,	July	Early Horn or Others	Spring
Cauliflowers	Feb. (in frames)	Snowball or Forcing	June
,,	March or April	Pearl or Favourite	July and August
,,	August or Sept.	Walcheren or Early London	May and June
Celery	March	Early White or Red	October
,,	April	Major Clarke	December
,,	,,	Standard Bearer	March
Cucumber	February	Telegraph	April
,, for framework	March	Matchless	May
,, ,,	April	Market Favourite	Summer
,, outside	,,	Long Ridge	,,
Endive	June	Green Curled	October
,,	July	Batavian	Winter
Leeks	Feb. or March	Lyon or Musselburgh	,,
Lettuce Cos	Feb. to Sept.	In Variety	May to Dec.
,, Cabbage	,,	In Variety, see Notes	April to April
Onions	March or earlier	In Variety	Aug. to April
,, winter varieties	Aug. or Sept.	Giant Rocca or Spanish	May to July
Parsley	Mar., May, July	Garnishing	All year
Parsnip	Feb. to April	Student or Hollow Crowned	October to April
Rhubarb	March or April	Early Albert	March
,,	,,	Champagne	April to June

WHAT TO SOW.	DATES FOR SOWING.	VARIETIES.	SEASON.
Radish . . .	Feb. to April	Early Kinds	April to June
,, . . .	May or June	Late Varieties	Summer
Peas . . .	February	Chelsea Gem	May
,, ...	March	Daisy or Stratagem	June
,, ...	April	Bountiful or Gradus	July
,, ...	May or June	Marrow Varieties	Aug. and Sept.
,, ...	July	Early Kinds, dwarf	October
Savoy Cabbage .	March	Green Curled	September
,, . .	April or May	Drumhead or New Gem / Savoy	Winter
Seakale . . .	March or April	Purple or White	,,
,, to plant .	April	,,	,,
Spinach . . .	March	Victoria	May
,, . . .	April or May	Longstanding	June
,, . . .	August	The Carter	Spring
Tomatoes, under glass . .	January	Conference or Ham Green	Summer
,, . . .	March	Duke of York	Autumn
,, for open ground .	,,	Laxton's Early	July
Turnips . . .	February	Early Milan	May
,, . . .	March	Snowball	June
,, . . .	June	Veitch's Globe	Autumn
,, . . .	August	Veitch's or Golden Globe	Winter
Vegetable Marrows .	April (in frames)	Early Albert	June
,, ,, .	May	Long White	July
,, ,, .	June	Bush or Custard	August
Herbs . . .	March to May	In Variety	,,
Potatoes . . .	Feb. (probable)	English Beauty	May and June
,, . . .	March	Ninety Fold or Ashleaf, in variety	,,
,, . . .	April	Main Crop Varieties or Late Up to Date	July to October
,, . . .	,,	Syon House Prolific or Triumph	Winter to Spring

FLOWERS

HARDY PERENNIALS

EXCLUDING BULBS AND ANNUALS

NAME.	COLOUR.	HEIGHT AND TIME OF FLOWERING.	GENERAL REMARKS.
Acanthus (Bear's Breech) .	Brownish and White	About 3 ft.	Valuable for their foliage. Useful to group in the garden; warm soil; hardy; several kinds—H. spinosissimus and A. mollis latifolius the finest.
Achillea mongolica . .	White	1½ ft. April & May	Very useful for cutting.
,, Ptarmica (The Pearl)	Double White	2½ ft., June & July	This is better than the ordinary Sneezewort (A. Ptarmica fl. pl.).

NAME.	COLOUR.	HEIGHT AND TIME OF FLOWERING	GENERAL REMARKS.
Anemone blanda (Windflower)	Blue, White, and other shades	Quite early year, 6 in.	Very pretty in rock garden in warm soils.
„ apennina . .	Blue	Spring, 6 in.	Very beautiful in colonies in grass, border, or rock garden.
„ Pulsatilla (Pasque-flower)	Purple	About Easter, 9 in.	Warm, gritty soil.
„ sylvestris and S. plena (Snowdrop Windflower)	White	May & June, 1½ ft.	Not very trustworthy, but very pretty.
„ japonica rubra.	Red	3 to 4 ft, Aug., Sept., Oct.	Noble plants for the border; grow well in masses, especially the white kind. The white Japanese Anemone is one of the first hardy perennials the beginner should grow. Its tall stems of white flowers are very beautiful, and very useful for cutting.
„ „ alba (Japanese Windflowers)	White		
Aconitum (Aconite) .	Blue	Autumn, 3 ft. to 5 ft.	Ordinary soil; A. Napellus has a poisonous root.
„ Napellus . .			
„ autumnale .			
Alstroëmerias (Peruvian Lilies)	Various colours	About 2½ ft., Oct.	There are several kinds and hybrids. A. aurea is very rich in colour. Masses of these in a rich, warm soil are very charming. They are often finer against a warm wall than in the border. Plant about 6 inches deep; remove seed pods; mulch in summer, and protect the crowns in severe winters with well-decayed leaves or similar material.
Anthericum (St. Bruno's Lily) Liliastrum	White	2 ft., Early Summer	The major form is very fine in the border; rather warm soil; divide roots in autumn for increase.
„ Liliastrum major	White, large flower		
Aquilegia (Columbine) Californica hybrids	Beautiful Orange Scarlet, &c.	2 ft., May–July	Special note elsewhere.
„ cœrulea hybrids.	Blue, White, &c.	1½ ft., June–July	
„ chrysantha .	Pale Yellow	3 ft. to 4 ft.	
„ glandulosa. .	Blue and White	2½ ft.	
Arnebia echioides (Prophet-flower)	Sulphur Yellow, with dark spots, which disappear as the flower ages	1 ft.	A well-drained soil; seeds or cuttings will give fresh stock.

ASTERS—PERENNIAL OR STARWORTS

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
Aster Acris . . .	Aug. 3rd wk.	3	Light blue, very effective, and fine for any purpose.
Amellus bessarabicus .	Sept. 1st ,,	2½	Pleasing blue, large flowers.
,, Stella . .	,, 1st ,,	2½	Distinct and paler than the type.
,, major . .	,, 1st ,,	2½	Larger flowers, and more compact than above.
,, Framfieldi .	Oct. 1st ,,	2½	Lilac blue.
,, Riverslea . .	Sept. 4th ,,	2½	Deep purplish blue, distinct.
Ptarmicoides. . .	,, 1st ,,	1	Very small white flowers, dwarf and compact.
Cordifolius major . .	,, 3rd ,,	5	Beautiful lilac flowers.
,, elegans .	Oct. 1st ,,	5	Very graceful habit, soft lilac flowers in abundance.
,, Diana . .	,, 2nd and 3rd wk.	4½	Charming and distinct variety, one of the best.
,, undulatus .	,, 2nd and 3rd wk.	5½	Similar to Cordifolius major.
Corymbosus . . .	Aug. 1st ,,	1½	Very early white, distinct species.
Diffusus horizontalis .	Oct. 2nd ,,	2½	Bronzy red and white flowers, very effective.
,, Coombe Fishacre	,, 2nd ,,	3	Flesh-coloured flowers, very free and fine, one of the best to withstand the wet.
,, pendulus . .	,, 4th ,,	4½	A graceful late variety.
Dumosus (syn. fragilis) .	Sept. 4th ,,	1¼	Very bushy and compact, mauve flowers.
Ericoides . . .	Oct. 3rd ,,	3	Drooping sprays of white flowers.
,, elegans . .	,, 1st ,,	3	Earlier than above, and very free flowering.
,, Clio . .	Sept. 4th ,,	3	Blush colour and distinct.
Asteroides . . .	,, 2nd ,,	6	Pale flesh-coloured flowers, very pleasing and lasting.
Henryi	,, 1st ,,	2	Bright blue flowers, distinct species.
Shorti	,, 1st ,,	4	Pale blue flowers, very good.
Vimineus . . .	Oct. 2nd ,,	3	Similar to ericoides, but of more twiggy growth.
,, Cassiope .	Sept. 4th ,,	2½	Earlier, and very dense growth.
,, nanus . .	,, 4th ,,	1½	Earlier, and much smaller flowers.
Puniceus pulcherrimus .	Oct. 1st ,,	7	Pyramidal habit, blush white flowers.
Pyrenæus . . .	Aug. 3rd ,,	1½	Dwarf, large pale blue flowers.
Umbellatus . . .	,, 4th ,,	5	Silvery white flowers, very distinct species.
Lanceolatus . . .	Oct. 3rd ,,	5	White, useful for cutting.
Lindleyanus nanus .	,, 2nd ,,	2	Very compact, small rosy lilac flowers.
Turbinellus . . .	,, and Nov.	4	Light and graceful, large violet flowers, tipped rose.
,, albus . .	,, 3rd wk.	3½	Smaller than above, with white flowers.
Grandiflorus . . .	Nov. 2nd ,,	3	Large deep violet flowers, very late and distinct.
Tradescanti . . .	,, 2nd ,,	4	Pure white, very effective.
Chapmanni . . .	Oct. 3rd ,,	5	Blue, very graceful.

NOVI BELGI TYPE AND HYBRID VARIETIES

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
Arcturus	Sept. 4th wk.	4½	Purplish blue flowers, very showy.
Apollo	,, 2nd ,,	5	Lavender blue, profuse bloomer.
Harpur Crewe	,, 4th ,,	5	Free-flowering white.
Tom Sawyer	Oct. 2nd ,,	5½	Large light blue flowers.
Ella	,, 1st ,,	5½	Bright showy blue.
Lævigatus	Sept. 4th ,,	2½	Bright pink, excellent.
Robert Parker	Oct. 1st ,,	6	Soft lavender blue.
John Wood	Sept. 3rd ,,	6	Strong growing, large white flowers.
Nancy	,, 3rd ,,	4	Compact, showy blue, very good.
Walter B. Childs	Oct. 3rd ,,	5½	Rosy lilac, splendid variety
White Spray	,, 3rd ,,	5	Best late white, large twisted petals.
Mai	,, 2nd ,,	4½	Large bright blue.
Mrs. C. W. Earle	,, 4th ,,	5	French grey, very good.
Floribundus	,, 1st ,,	4½	Deep violet-blue, very free.
Formosissimus	Sept. 4th ,,	4	Erect habit, rosy lilac flowers.
Cottage Maid	,, 2nd ,,	4	Delicate flesh colour, flowers profusely.
Madonna	,, 3rd ,,	3	Compact, large flowered white.
Densus	Oct. 1st ,,	3½	Very showy blue, dense growth.
Pleiad	Sept. 4th ,,	1¼	Bright rose flowers, excellent variety.
T. Smith	,, 3rd ,,	4	Dense flower heads.
Margaret	,, 2nd ,,	4½	Large flowers, of a delicate blue shade.
Daphne	,, 4th ,,	4	Large deep blue flowers, with black stems.
Minerva	Oct. 2nd ,,	4	Deep rosy lilac, large and free.
Purity	Sept. 3rd ,,	5	Early flowering white.
Versicolor	,, 1st ,,	4½	White, changing to purple.
,, Themis	Oct. 2nd ,,	2	White, changing to purple, compact and free.

NOVÆ ANGLIÆ TYPE

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
Novæ Angliæ præcox	Sept. 2nd wk.	4½	Crimson and purple flowers, earliest of this type.
Novæ Angliæ (Mrs. J. F. Raynor)	Oct. 1st ,,	4½	Vivid large crimson flowers, improvement on N. A. ruber.
Novæ Angliæ roseus	,, 2nd ,,	7	Rose coloured flowers.
Novæ Angliæ ruber	,, 3rd ,,	5½	Rich crimson flowers.
Novæ Angliæ pulchellus	,, 2nd ,,	4½	Violet blue flowers.
Novæ Angliæ (Wm. Bowman)	,, 1st ,,	5	Rosy purple, with golden bronze disc.
Novæ Angliæ (Melpomene)	,, 2nd ,,	4½	Large light purple.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Bocconia cordata (Plume Poppy)	Brownish	Over 6	A very handsome plant for rougher parts of the garden. Picturesque silvery-toned leaves and brownish flower scapes. Easily increased by division of the roots.
Buphthalmum speciosum .	Yellow	Tall	This is not a plant for small borders, it is too rough; but for grouping in the wilder parts is very useful. Increased by root division. Also called Telekia speciosa.
Camassia esculenta (Quamash)	Blue, but there is a white variety; July	1½ to 3	Very pleasing plant; likes a rather moist soil.
Campanulas (Bell-flowers) .	...	Various	See separate article.
Catananche cærulea (Blue Cupidone)	Blue and White	2½	Easily grown and raised from seed.
Centaurea babylonica .	Yellow; Summer and early Autumn	10	Loamy soil; very strong-growing, silvery-leaved plant; spikes of yellow flowers; often beautiful on a wall.
,, macrocephala .	Golden Yellow; Summer	5	Strong plant; too much so ordinary borders.
,, montana .	Red & White; 2 forms; Summer	2½	Quite happy almost anywhere.
Cheiranthus Cheiri (Common Wallflower)	Spring	Various	The Wallflower is a fragrant and familiar garden flower, scenting the borders with its rich perfume in the springtime of the year. It is often happy in the chinks and crevices of old walls. There are many varieties, some quite dwarf, but these are not so graceful as those of taller growth. Very effective are such kinds as Belvoir Castle, much used in the famous spring gardening at Belvoir Castle; Harbinger, and the rich-coloured blood-red. There are double Wallflowers, too, but these are without the grace and beauty of flower form conspicuous in the single kinds. Wallflowers are easily raised from seed sown in early May. Transplant the seedlings, otherwise the tap root develops unchecked. It is wise to plant the Wallflowers in their perma-

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Cheiranthus Cheiri (Common Wallflower	Spring	Various	nent quarters about the end of June. When planted very late in the autumn or in the following spring, frosts play havoc with the growth.
Chelone Lyoni . . .	Deep Pink; Late Summer	2½	Very graceful plants, with spikes of bright blossom. Increased by division, seeds, or by cuttings. A group of them is interesting.
,, obliqua . .	Lighter Pink; Late Summer	2½	
Chrysanthemum maximum	White; July, Aug.	2	A good border plant, easily grown.
Convolvulus mauritanicus .	Blue	...	This is a prostrate plant, and very beautiful as an edging in warm soils and sunny positions.
Coreopsis lanceolata grandiflora	Golden Yellow; July–Sept.	2 or 3	A glorious plant. Sow seeds in spring, and plant out in autumn for flowering next year.
Dictamnus Fraxinella .	Reddish July, Aug.	3	A quaint border, called also Burning Bush; light, dry soil; partial shade.
,, alba . . .	White	3	
Doronicum Clusi . .	Rich Yellow; April, May	2	Vigorous, early-flowering border plants.
,, plantagineum excelsum		3	
Delphinium (Perennial Larkspurs)	Various Colours	Various	See separate article.
Dielytra spectabilis (Lyre-flower or Bleeding Heart)	Rose	2	A pretty early border plant, so early that it sometimes gets cut by late frosts; light soil; much grown in pots.
Delphinium Belladonna .	Pale Blue	2	A charming kind. Slugs are very fond of it. A good group is delightful.
Dodecatheon Jeffreyanum (American Cowslip)	Purple; early Summer	2	A favourite hardy border plant, one of the best of its group. Good loam, and increased by division.
Echinacea purpurea . .	Reddish-Purple; Aug., Sept.	3½	Ordinary soil.
Echinops Ritro . . .	Bluish heads	4	Ordinary soils, but not too damp.
,, sphærocephalus .	White heads Aug., Sept.	4	
Eremurus himalaicus .	White	4–5	Noble plants to group with bold, hardy perennials. Rich loam, not heavy; well drained, sheltered position. Give yearly mulch of well-decayed manure. Plant in autumn. During severe weather give protection with some such material as cocoa-nut fibre refuse.
,, robustus . .	Pink & Peach; May, June	9–10	
Erigeron speciosus superbus	Purplish Blue; May, June, and Autumn	2½	Almost any soil. Most useful plant for its long flowering-time.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Eryngiums (Sea Hollies) .	Steely-Blue bracts; Autumn	Various	The Eryngiums form an important group of garden plants. Their steely-blue stems are useful in winter decorations. A warm, dry border is the place for them. E. maritimum is our native Sea Holly of the beach. The finest kinds are the small-flowered E. planum, E. olivierianum, E. alpinum, and E. giganteum.
Funkias	...	...	There are several beautiful Funkias, plants of importance for their handsome foliage, and spikes of often very fragrant white flowers. A few have variegated foliage, one of the most pleasing being F. undulata variegata. F. lancifolia has white flowers, and of this species there are pretty variegated forms. F. ovata is also well known, and F. Sieboldi. But for ordinary gardens, F. subcordata grandiflora and F. Sieboldi are the only Funkias one need trouble about. If the flower is wanted (and it is a pretty and desirable bunch of white, lily-like bloom), F. grandiflora should have a sunny place, but here the leaves are apt to burn, and to turn yellow. Its best use is probably as a plant for foliage, and in a half shady place, where it never receives direct sunshine, it may be seen at its best. It is also a capital pot or tub plant, especially for town gardens. Plant in autumn.
Gaillardias . . .	Crimson, Yellow and Old Gold; Summer, Autumn	2½	Warm soils.
Galax aphylla . . .	White; Summer	8 inches	The leaves of this neat North American plant are heart-shaped and prettily toothed at the edges, of thin but firm texture, and boldly carried on strong but slender wire-like stalks from 4 inches to

ECHINOPS

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Galax aphylla . . .	White; Summer	8 inches	9 inches high, and sometimes higher still when well-established clumps are growing in the moist peaty leaf-mould that suits it best. The bloom is a slender spike of white flowers in July; but in midwinter the beauty of the plant is in the high colouring of the leaves. Some are of a fine red tint throughout; others are spotted and marbled with red upon a ground of pale green, and have a border that is almost scarlet. One may look at a dozen leaves and find in each a different proportion and disposition of the red colouring, but all have the same aspect of neat and well-ordered beauty. It is perfectly hardy; a plant for all Great Britain, in cool rocky nooks or peat-bed edges.
Gentiana acaulis (Gentianella)	Blue; April, May	½	This is a trio of very beautiful Gentians for the border. The Gentianella is described amongst the plants for edgings. G. asclepiadea likes shade and shelter, and for that reason may be put in the woodland. Septemfida enjoys a moist, light soil.
,, asclepiadea .	Purple Blue; Aug., Sept.	2	
,, septemfida . .	Bright Blue; July–Sept.	½	
Geranium armenum . .	Crimson Purple; June, July	2	Beautiful border plants; ordinary soil. G. armenum is one of the finest perennials in existence.
,, Endressi . .	Rose; June–Sept.	1½	
Galega officinalis . .	Purplish	2–3	Quite at home in ordinary soils. The white variety is very useful for cutting.
,, ,, alba .	Pure White; Summer	2–3	
Gaura Lindheimeri . .	Rose; Summer	4	Warm, light soils.
Geum coccineum plenum .	Shades of Orange and Scarlet; July, Aug.	2	Effective border plants, and very useful. Continue long in bloom. Ordinary soil.
,, Heldreichi . .	Ditto; June, July	1½	
,, miniatum . .	Ditto; Spring, Autumn	2	
Gillenia trifoliata . .	White; June, July	2½	A pretty, slender-spiked flower.
Gypsophila paniculata .	Small, white, fleecy, lace-like flowers; Aug.	2	This is a very useful plant, making billowy masses of white bloom. The lace-like flowers are much sold in the London streets.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Helianthus (Perennial Sunflowers)	Yellow	Various	See separate article.
Helleborus niger (Christmas Rose)	White	1	The Christmas Rose is a beautiful pearly flower of winter, evergreen, and a pleasure to seek for in December, when the rose-tinted buds nestle among the full green foliage. There are several charming varieties, and by judicious selection flowers may be obtained throughout the winter months. Hellebores are not difficult to manage. Their chief requirement is a well-prepared soil, facing east, and sheltered. Before planting well trench the site three feet deep, adding plenty of well-decayed manure; and choose strong crowns, putting them about three feet apart each way. When the Hellebores are planted to form a margin it is not, of course, possible to put a hand-light or frame over them without probably making an ugly blotch in the garden; but a hand-light certainly protects the flowers from rains and frosts, and, when protection is given before the buds open, the fully expanded flowers are quite unsullied. A few clumps of Hellebores provide plenty of material for cutting. Where cut flowers, especially in winter, are desired, put a strong crown or crowns in tubs, or even deep boxes, and transfer to the greenhouse to flower. The time to plant Christmas Roses is the autumn or spring; and, for the amateur, propagation is best effected by division of the roots in July. The most beautiful varieties are the following:—*Maximus*, also known as *altifolius*, should be selected where there is space for only one kind; it blooms

HELIANTHUS RIGIDUS MISS MELLISH

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Helleborus niger (Christmas Rose)	White	1	early (October), and has white or rose-tinted flowers between 3 inches and 5 inches across, and three flowers sometimes appear on each stem. *Angustifolius*, as the name suggests, has narrow leaves; its flowers are very pure. St. Brigid (syn. *Juvernis*) has pale green leaves, apple-green flower stems, and very pure white, cup-shaped flowers; it is not so hardy as the others. *Major*, or the Bath variety, is a noble kind, and much grown as a market flower. It is a strong form of the ordinary *H. niger Riverstoni* is a tall, strong plant, with large, quite pure white flowers on apple-green stems. Apple Blossom, or *H. n. carnea*, has dark stems and leaves and flesh-tinted flowers. Those who are interested in raising new forms should cross-fertilise the best flowers on a few plants, and make a sowing of seed every year. When the seed is sown, as soon as it is ripe, say in June, the seedlings will appear above ground during the following March or April. The young plants grow freely, and flower from the third to the fifth year from seed. These seedling plants are luxuriant, and yield a larger proportion of large and well-shaped flowers than, as a rule, the divided plants. These flowers, although freely visited by bees and flies, rarely seed abundantly unless cross-fertilised with pollen from other individual plants or varieties. It is best to get pollen-bearing flowers from a friend's garden at a distance, as the late "St. Brigid" always used to do. The Lenten Roses are so called because of their

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Helleborus niger (Christmas Rose	White	1	flowering about the time of the Lenten season, though many kinds bloom in January. This race has been secured by free cross-fertilisation of several species. There are many lovely hybrids, some almost self, others blotched and suffused with colour, as rich and effective as anything painted upon the flower of an orchid. Many of the hybrids are named, others seedlings, and amongst these occur flowers of beautiful and diversified colouring. *H. orientalis* is very charming, a creamy white flower touched with green; *H. o. antiquorum*, Willie Barr, rose-colour; *H. o.* Commerzienrath Benary, white, with spots of crimson; *H. o.* Gertrude Jekyll, pure white; *H. o.* Gretchen Heinemann, rose-purple; *H. o. guttatus*, white; *H. o. punctatissimus*, rose-purple, with rich spots of colour; and *H. o. roseus*, deep rose. The Lenten Roses are very easily grown in a fairly shady border, and may be raised from seed sown when ripe out of doors. It is needful to watch the plants when about to flower. Mice have a strange fondness for the buds. The flowers when gathered for the house quickly fade unless the base of the flower stem is split into four divisions for about 3 inches up the stem, or stalk, to use a more popular word. There are many other Hellebores. *H. fœtidus*, a native species, is handsome when grouped; it has luxuriant deep green foliage, and spikes of greenish coloured flowers; the association of leaf and flower colour is pleasant to see.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Helenium autumnale. .	Yellow; Summer and Autumn	3	The Heleniums are very useful, strong, vigorous, and free, with yellow flowers. H. autumnale is the best known, and of this there is a fine form named grandiflorum.
,, pumilum . .	Golden; Summer and Autumn	2	
,, grandicephalum striatum .	Crimson and Gold; Summer and Autumn	4–6	
Hemerocallis (Day-Lily), flava	Rich Yellow, June, July	2½	There are many kinds, but these are the most useful. The flowers of the Day-Lily last only about a day, but a succession is maintained. They are a success in ordinary soil in shady places, and are very useful in small gardens for filling places almost entirely in the shade.
,, Thunbergi . .	Soft Yellow, July–September	2	
,, Kwanso fl. pl. . .	Bronzy-Orange, July, August	3	
,, aurantiaca major .	Golden-Orange, July, August	3	
Hesperis matronalis albo plena (Double White Rocket)	...	...	See separate article.
Heuchera sanguinea . .	Scarlet, May, June	2	Very bright flowers for warm soils, but propagate by division of the tufts after flowering, because seedlings vary considerably. Some of the Heucheras, H. glabra, and H. Richardsoni, have very highly-coloured leaves in winter.
,, s. splendens . .	Vermilion, May, June	2	
Iberis correæfolia . .	White, May, June	½	Very hardy and free.
Hollyhocks . . .	...	...	See separate list.
Incarvillea Delavayi . .	Purplish Crimson; May, June	2	This is a beautiful hardy plant, little understood; it is named after a French missionary, the Abbé Delavay, who discovered it in China, at an elevation of between 8000 to 10,000 feet. At first it was grown under glass, but in rich friable loam at Colchester it has proved quite hardy, and is easily raised from seed.
Irises	...	...	See separate list.
Lathyrus (Everlasting Pea)	...	...	See separate list.
Kniphofia (Tritoma) . .	Autumn	Various	This group is known as the Flame-flower, because of the brilliant colouring of the scapes. There are many noble kinds, grandis being one of the most handsome; gracilis is another. These two, with the common Uvaria, will

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Kniphofia (Tritoma) . .	Autumn	Various	suffice in a small garden. There are many charming hybrids as yet uncommon. Deep, well-drained soil is necessary. Hard winters frequently kill the plants, but danger of this is reduced if the roots are put well down, and then a thick covering of dry leaves put over the crowns. Top dress with well-decayed manure in spring. For increase, divide the roots in autumn or in spring.
Lobelias, Scarlet (Lobelia cardinalis)	Scarlet; Summer	3, with spike	There are many charming forms of the Scarlet Lobelia. Queen Victoria and Firefly are the two most brilliant, with bronzy-brown foliage, too—a rich contrast. Plant in spring, and in very cold localities lift and plant in a frame, as they are not very hardy. A deep bed in which is mixed well-decayed manure is necessary; they also enjoy moisture. For increase, divide in spring; and as seedlings come very true to the type, seed may be sown in June in shallow pans of light soil, and the seedlings planted out in the following spring. Cuttings of moderately ripened shoots may be struck in gentle warmth in spring.

SCARLET LOBELIA

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Lupinus arboreus (Tree Lupine)	Soft Yellow; June–August	4–6	The Tree Lupine likes plenty of warmth, sunshine, and a light soil. Seeds are easily raised, but plants vary considerably. When a good form is got, perpetuate it by cuttings taken from the branch with a little heel, and put in pots in a cold frame. The shrub, for such it may be called, has very fragrant blossom. The others are handsome, especially the white polyphyllus on banks and borders.
,, nootkanensis . .	Dark Blue; May	1½	
,, polyphyllus . .	Purple; July	3	
,, p. albus	Pure White; June, July	3	
Lychnis chalcedonica plena	Scarlet; July, August	3	A beautiful family. L. chalcedonica is a handsome border plant. Haageana is more biennial than anything else. All the kinds like a warm soil and sunny place.
,, dioica rubra plena .	Red-Crimson; May, June	2	
,, Vespertina plena .	Double White; July–Sept.	3	
,, haageana, in variety	Vermilion-Scarlet; August, September	2	
,, Viscaria splendens plena	Red-Crimson; June–August	1½	
Megaseas	Spring	1½	There are many Megaseas, or Saxifragas, as they were formerly called. They are handsome plants, with bold, thick, quite leathery leaves, which, in winter, take on beautiful rose-crimson and bronzy-green colours. Succeed almost anywhere. Make good edgings or rough groups in the shrubbery margin and flower garden. The early flowers are often cut by frosts. Cordifolia, and its purple flowered variety purpurea, purpurascens, ligulata, and Stracheyi, are the most important.
Mertensia sibirica . .	Beautiful Bluish; Early Summer	1½	Warm soil or rock garden. Not very vigorous.
,, virginica	Lavender Blue; April–May	1½	Moist, peaty soil.
Monarda didyma . .	Crimson-Scarlet; June–July	2½	This is known as the Bee Balm or Oswego Tea; scarlet flowers; likes moisture, but will do in ordinary border; flowers for several weeks.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Mimulus (Monkey-flower) .	Various; Summer	½	The Mimulus includes the Common Musk, which is happy out of doors in a cool moist place like all the rest of the family. M. cardinalis and M. cupreus are very bright, and the hybrids usually grown in pots especially so. The Musk and the larger variety named Harrison's are excellent for pots.
Morina longiflora . .	Rose coloured; June, July	2	A picturesque thistle-like plant for the border.
Œnothera (Evening Primrose)	...	...	See separate article.
Myosotis (Forget-me-not) .	Blue	½	There are many Forget-me-nots, but the chief one for the small garden or for the beginner is M. dissitiflora, which may be easily raised from seed sown as soon as ripe, or roots may be divided. But it sows itself about freely, and the pretty blue colouring of the flowers is welcome.
Montbretias . . .	Yellow, Orange; Summer, Autumn	3-4	The Montbretias are delightful for warm borders. The Tritonias are now grouped with them. M. Pottsi and M. crocosmiæflora are the most important. Although they succeed in heavy soils, porous, well-drained ones are the best. Partial shelter is not objectionable to them. The following hybrids are very beautiful:—M. Bouquet Parfait, yellow and vermilion; Drap d'Or, golden; Etoile de Feu, orange-red and yellow; Phare, crimson; Rayon d'Or, deep yellow; and Solfaterre, primrose colour.
Omphalodes verna . .	Deep Blue; Spring	1	A charming plant, with beautiful blue flowers. It is at home under shrubs, and likes a cool moist soil. We have seen it very charming at the foot of a Holly hedge; belongs to the Borage family.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Pyrethrum . . .	Various; Early Summer	1	The Pyrethrums are very useful border plants, thriving best in deep soils; many kinds, double and single, and in colour varying from white to intense crimson.
Pæonia (Pæony) . .	...	...	See separate article for description of the garden kinds.
,, corallina . .	Carmine Single; Summer	3	This has coral-coloured seeds, which render the plant attractive in autumn.
,, Emodi . . .	White; Summer	3	A very beautiful species.
,, paradoxa . .	Purple Red; Single	3	An attractive kind for its colour.
,, peregrina . .	Rich Crimson; Single	3	Of this there are several varieties, such as Brilliant and Blushing Maid.
,, tenuifolia . .	Rich Crimson; Single	3	This is easily known by its feathery foliage; quite a good garden plant; the double form is handsome.
,, wittmaniana . .	Single; Primrose Yellow	3	Very handsome. The single Pæonies (species) such as those enumerated are amongst the most beautiful of garden plants, and appreciate partial shade. This, too, prolongs the beauty of the flowers.
,, tree and herbaceous	Various; May, June, July	Various	See separate article.
Pentstemon barbatus Torreyi	Scarlet; June–August	2½	A very graceful and effective plant for warm soils. The garden Pentstemons are described in a separate article.
Papaver (Poppy) . .	Various	Various	See separate articles and notes.
Papaver orientale (Eastern Poppy)	Crimson, Scarlet, and Orange; May, June	2½	The finest variety is bracteatum. We care little for the paler pinkish shades. A noble group of perennials for wild places or the larger borders.
Phlox, herbaceous . .	Various; June, July, & August	Various	See separate article.
Phygelius capensis . .	Scarlet; Summer	3	This is most at home on a warm sunny border.
Physalis Alkekengi . .	A winter plant	2	The Physalis is grown for winter effect, and is of value for its orange-scarlet, bladder-like calyx enclosing a small tomato-like fruit. P. A. Fran-
,, Franchetti . .	...	...	

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Physalis Franchetti . .	...	...	chetti is larger in all its parts. These stems of showy "bladders" are useful for indoor decorations. Warm, fairly light soils.
Pinks	...	...	See separate article.
Platycodon grandiflorum .	Bluish Purple; Summer	1½	A well-drained, deep, loamy soil. Good border plant. Mariesi is a quite dwarf variety, same colour; but there is a white form. Propagate by root division in the spring.
Plumbago Larpentæ. .	Blue; Autumn	1½	Neat plant; warm soil; sunny place; good for sunny rockwork.
Polemonium cæruleum (Jacob's Ladder)	Blue; also White varieties	1½	The Jacob's Ladders are a very pleasing group of hardy plants, requiring well-drained soil, otherwise they will certainly damp off in winter.
,, Richardsoni .	Blue, and also White form	2	
,, himalaicum .	,,	2	

WINTER CHERRY
(Physalis Alkekengi)

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Polygonatum (Solomon's Seal)	Creamy White	2	P. multiflorum is a charming plant; most happy in shade of tree, copse, or by some shady walk. P. officinale is a smaller form. A moist, rich loam is the best soil; and it is advisable to top-dress the plants yearly with leaf-mould. Solomon's Seal may be increased by seed in spring or division in autumn or spring.
Polygonums (Knot Weeds)	Creamy White; Autumn	Various	The Polygonums are better adapted for quite rough places, or to stand singly on the lawn. P. cuspidatum and its variety conpactum are the most common, but the roots run all over the garden. P. sachalinense is handsome by waterside; it is 8 or 9 or even more feet high. P. molle is very beautiful, almost a climber, with white fleecy flowers in autumn.
Primulas (Primroses, &c.)	...	...	See separate article.
Potentillas	Various; Summer	1	A race of good garden flowers in light soil or sunny places. There are several fine varieties.
Ranunculus aconitifolius pl. (Fair Maid of France)	White; April, May	2	Cool, moist place. The double kind is effective.
Rockets, Sweet	...	...	See separate article.
Rudbeckia Newmani	Gold and Black; August-October	2	A free-growing, good, border plant. Very effective.
,, purpurea	Purple; Autumn	6	Tall, late, and welcome. Ordinary border soil.
Saponaria officinalis fl. pl. (Soapwort)	Blush; Autumn;	3	A very strong and free-growing plant. Will live almost anywhere.
Saxifragas	Various	Various	The Megaseas are described elsewhere. Saxifragas form a most important family, and comprise a host of species and varieties. Some are mentioned in the list of rock plants. Others of importance are S. Camposi, which blooms in early spring, and has large white flowers. S. Cotyledon and its variety pyramidalis, especially the last named, are delightful; produce panicles of white-pink, dotted flowers. S. granulata is

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Saxifragas. . . .	Various	Various	the native Meadow Saxifrage, and its double variety is charming. S. hypnoides is the Mossy Saxifrage so much used for edgings; will grow almost anywhere. S. longifolia, with its crusted foliage and flower panicles, S. sarmentosa, "Mother of Thousands" of cottage-windows, the London Pride (S. umbrosa), and the brilliant early dwarf, S. oppositifolia and its forms, must also be included.
Scabiosa caucasica . .	Blue-Lilac; June–September	2½	Tall, graceful stems; must have well-drained, light soil
,, ,, alba .	White	...	
Sedum (Stonecrop) . .	Various	Various	Several kinds are given in the rock-garden list. The Stonecrops are delightful plants for edgings. A popular, tall kind (1½ ft.) for gardens, town or country, is S. spectabile, which makes quite a little bush, with rose-coloured flower clusters in autumn. Will grow almost anywhere.
Senecio japonicus . .	Deep Orange; Summer	5	Only suitable for rich, moist soils.
,, pulcher. . .	Warm Purple; September	1½	Only in rich soils, and positions screened from keen winds; its leaves are fleshy and easily torn; and the flowers are sometimes spoilt by early frost.
Solidago (Golden Rod) .	Yellow; Autumn	Various	Grow anywhere; rather too vigorous, but effective in borders and rough places. S. canadensis and S. Virgaurea are good kinds.
Thalictrum aquilegifolium	Creamy; June	2½	Tall plants; quite ball-like flower heads; very graceful and beautiful with their bold fern-like leaves too.
,, ,, purpureum	Purple; June	2½	
Tiarella cordifolia (Foam-flower)	Creamy; May and June	1	Moist, cool soils. Very charming in groups in front of borders or to form a kind of margin.
Trollius	Various; Spring and Summer	Various	The Trolliuses, or Globe flowers, are charming early flowering perennials. They like moisture and rich soil. You cannot do

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Trollius	Various; Spring and Summer	Various	better than have the rich yellow T. napellifolius, deep orange T. Fortunei, (japonicus fl. pl.), golden coloured Asiaticus, and a variety called Orange Globe; all very handsome.
Tropæolum polyphyllum .	Yellow; Summer	Trails	This is a noble plant, and is not always happy in gardens. It likes to wind about and through shrubs, and in loamy soil. The leaves are greyish. Where the garden is of sufficient size for such plants as this, every effort should be made to establish it.
Tropæolum speciosum (Flame Nasturtium)	Crimson; Summer	Trails	Every enthusiastic amateur almost tries to establish this Tropæolum, but it is fickle. This is the climber that covers many a Highland cottage with beauty, and it enjoys the bracing mountain air. Plant it where its graceful shoots can overhang some ledge, and wind through some shrubbery. The best soil is moist loam mixed with some peat, and shade is important. Put the roots half a foot deep, and do not disturb them.
Tussilago fragrans (Winter Heliotrope)	Greyish; Winter	½	This is a flower of winter, with nutty perfume, and grows in ordinary soils. Only of value for its perfume.
Veronicas . . .	Various	Various	The Veronicas are a pretty family. V. longifolia subsessilis, which is about 3 feet high, is one of the most important: its flowers are blue. V. rupestris and V. repens are creeping, and form quite a green mat, covered with blue bloom in summer. V. incana is welcome for its silvery foliage. V. gentianoides and its varieties are suitable too, but the best for the ordinary border is longifolia subsessilis. They succeed in ordinary soil.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Xerophyllum asphodeloides (Turkey Beard) . .	Ivory White ; Summer	3	A stately plant, with a dense head of bloom ; appreciates moisture, shade, and a peaty soil. It has grassy foliage, and is not a plant for every garden.
Zauschneria californica . " " splendens	Vermilion-Scarlet ; Early Autumn	1	The variety splendens is a fine form in warm, light soil, and we have known this plant happy in the chinks of old walls. Propagate by root division or seeds in spring.
Trillium (Trinity-flower, or White Wood Lily)	Various	1	The most beautiful of this group is T. grandiflorum which has pure white flowers, and is delightful for a moist, shady, peaty place in the rock-garden, or at the margins of evergreen or deciduous shrubs. T. sessile, T. californicum, T. erectum, and one or two others are good too, but none approach grandiflorum.

CLIMBERS OF QUICK GROWTH

Annual Climbers.—The small garden, and for that matter the larger ones too, would suffer if the annual climbers were not available. The Canary Creeper (*Tropæolum canariense*), which will cover a pole or hide a stretch of fence in a single season, is one of the most useful kinds, and there is fresh beauty in its green leaves and bright yellow flowers. The Japanese Hop is a climber of wonderful growth. It is irresistible, covering a pergola or summer-house even in a few weeks. Its variegated variety is pretty and distinct. Sweet Peas will hide a fence or scramble over some ugly spot, not of great height; and amongst other climbers are the popular climbing Nasturtiums or Tropæolums, varieties of *T. lobbianum*, and the bright-coloured, always welcome Convolvulus minor and major. A very pretty red and yellowish tender annual is *Mina lobata*, but it is not always a success, requiring a very warm spot and thoroughly well drained soil. The seeds of this must be sown in heat in spring, and the same may be written of *Thunbergia alata*. Mr. Greenwood Pim, a sincere lover of flowers, writes of the Thunbergia that, "though in cultivation for three-quarters of a century, it is not so often seen as its merits deserve." It belongs to the order Acanthaceæ, and is a very slender, twining plant, practically an annual, though, under favourable circumstances, perennial. It occurs commonly in six varieties—white, light buff, and light orange, each with a self-coloured throat, and the same series with a purple-black throat, from which it sometimes gets the name of Black-eyed Susan. It is extremely easily grown, and will do in the stove, greenhouse, or, after a fashion, outside, but an airy greenhouse seems to suit it best. Sown in January, it will flower all the summer with ordinary care, but look out for red spider. If the cultivator possess a microscope, the hairs on the stamens will repay examination. The plant is a native of the East.

Annual Grasses.—Many of these are of delicate beauty; they may be raised from seed sown in spring in the open ground. A good selection would comprise: *Agrostis pulchella*, a beautiful small grass; *A. nebulosa*, and the popular fluffy Hair-tail Grass (*Lagurus ovatus*), which should be chosen first, because of its distinctness. Also beautiful are the large Quaking Grass (*Briza maxima*), *B. minima*, which is smaller, hence

the name; *Eragrostis elegans*, a very graceful grass; and the Barley Grass (*Hordeum jubatum*). The seed should be sown early in April; and the seed of some kinds, *Agrostis pulchella* in particular, is so fine that it is necessary to mix it with fine soil to insure even distribution. Sow the seeds where they are to remain, and when the sowings have been thick, thin out judiciously. *Eragrostis elegans* is pretty by waterside, and will sometimes perpetuate itself. These grasses are very pretty and useful used for winter decoration, and when required for this purpose it is needful to gather them before heavy rains occur. Gather them on a bright afternoon, tie them into small bundles, place in a dry room away from the window, and in an upright position.

PLANTS SUITABLE FOR COLD GREENHOUSE

Shrubby Plants

In House absolutely Unheated.

Abelia rupestris
Amygdalus nanus (Dwarf Almond)
Azalea, Ghent and mollis varieties
Berberis Darwini
Camellia japonica varieties
,, Sasanqua
Choisya ternata (Mexican Orange-flower)
Cistus lusitanicus
Coronilla glauca
Cytisus filipes
Daphne Mezereum (Common Mezereon)
Deutzia gracilis
,, Lemoinei
Erica herbacea
,, mediterranea
Fabiana imbricata
Fuchsia Mme. Cornellison
Hydrangea hortensis
,, Thomas Hogg
Hypericum moserianum
,, patulum
Jasminum nudiflorum (Winter-flowering Jasmine)
Magnolia conspicua (the Yulan)
,, stellata (pots)
Myrtle, Small-leaved
Nerium oleander
Pernettya mucronata
Prunus sinensis fl. pl.
,, davidiana
,, triloba
Ribes sanguinea and sanguinea alba (small plants in pots)
Rhododendron
,, dahuricum
,, Early Gem
,, ignescens
,, nobleanum
,, præcox, and other florist varieties
Veronica Andersoni, and other shrubby varieties
Viburnum Tinus (Laurustinus)
,, lucidum
,, plicatum
Weigela hortensis nivea

In House with Winter Temperature not below 35°.

Abutilon vitifolium
Acacia armata
Azalea indica varieties
Brugmansia sanguinea
,, suaveolens
Cassia corymbosa
Cistus purpureus
Clianthus puniceus (Glory Pea)
Daphne indica
Echium fastuosum
Gillenia trifoliata
Hypericum chinense
Lemon and Orange Trees
Pæonies, Moutan, in pots
Poinciana Gilliesi
Polygala dalmaisiana
Rubus rosæfolius

Climbers

In House absolutely Unheated.

Akebia quinata
Clematis calycina and florist varieties (Patens type)
Humulus japonicus (Japanese Hop)
Mina lobata
Smilax aspera
Solanum jasminoides
Stauntonia latifolia

Roses—Celine Forestier
Lamarque
Maréchal Niel
Noisette, and others

In House with Winter Temperature not below 35°.

Clematis indivisa
Hibbertia dentata
Habrothammus elegans
,, fascicularis
Kennedya Marryattiæ
,, lilacina
Lapageria
Lonicera (Honeysuckle) sempervirens
Maurandya barclayana
Mandevillea suaveolens
Nasturtium (Tropæolum lobbianum varieties)
Tropæolum azureum
,, pentaphyllum
,, tricolor

Bulbs and Tubers

Allium neapolitanum
Anemone apennina (Apennine Windflower)
,, blanda
,, coronaria
,, fulgens
,, stellata (hortensis)
Anomatheca cruenta
Anthericum liliastrum
Chionodoxa luciliæ
,, sardensis
Crinum Powelli
Crocosmia aurea
Crocus Imperati, and others
Cyclamen coum
,, europæum
,, hederæfolium
,, vernum
Erythronium Dens canis (Dog's-tooth Violet)
Fritillaria Meleagris
,, alba
,, pallidiflora
,, pudica
Funkia grandiflora
,, Sieboldi
Galtonia candicans
Gladiolus ramosus section—Colvillei, albus, &c.
Hyacinths, Florists' and Roman
Iris alata
,, reticulata
,, stylosa
,, tuberosa
,, Spanish vars.
Jonquils, N. capax fl. pl.
,, N. odorus
Kniphofia corallina (Flame-flower)
,, Macowani
,, longicollis
Lilium candidum
,, davuricum
,, speciosum
,, tigrinum, &c.
Lily of the Valley

Agapanthus umbellatus
Alstroëmeria pelegrina alba
Amaryllis formosissimus
Anoiganthus brevifolius
Blandfordias
Cannas
Clivia miniata
Cosmos diversifolia atrosanguinea (Black Dahlia)
Crinum Moorei
Hæmanthus albiflos
Iris chinense
Ixias
Lachenalias Nelsoni
,, pendula
,, tricolor, and others
Libertia formosa
Lilium longiflorum
,, tenuifolium, and others
Ornithogalum arabicum
Oxalis cernua
,, versicolor
Vallota purpurea
Veltheimia viridifolia
Zephyranthes carinata

In House absolutely Unheated.

Milla uniflora
Montbretias
Muscari botryoides album
Narcissi (Trumpet Daffodils)
,, Emperor
,, Horsfieldi
,, Grandee
,, obvallaris
,, Soleil d'Or (Tazetta vars.
,, Grand Monarche
,, Bulbocodium (Corbularias)
,, citrina
,, monophylla
,, triandrus
Ornithogalum nutans
Ranunculus Persian vars.
Schizostylis coccinea
Scilla hispanica
,, sibirica
Sisyrinchium grandiflorum
Tecophylœa cyano-crocus
Trillium grandiflorum
Tulipa clusiana
,, fragrans
,, retroflexa, and florists' vars.
Zephyranthes candida
,, rosea

In House with Winter Temperature not below 35°.

Some Foliage Plants

Acanthus latifolius
,, mollis
,, spinosus
Aralia japonica
Asparagus verticillatus
Aucubas
Carex japonica
Centaurea ragusina
Chamærops excelsa (Fan Palm)
Cineraria maritima
Equisetum sylvaticus
Eucalyptus globulus
Eugenia buxifolia
Eulalia japonica
,, variegata
Euonymus radicans variegatus
Ivies, small variegated
Myrtle, large-leaved
Ribbon Grass
Thalictrum adiantifolium
Aspidistra lurida
Dracæna australis
,, indivisa (in pots)
Eulalia zebrina
Ruscus racemosus

Miscellaneous Pot Plants

Aquilegia cœrulea
Calceolaria violacea
Campanula Allioni
,, fragillis
,, isophylla
,, pyramidalis
Carnations, Marguerite vars.
Cheiranthus (Wallflower) alpinus
,, Cheiri, Florists' vars.
Dahlia glabrata
Delphinium sinense
Dianthus Heddewigii
Dielytra spectabilis
Arctotis aspera
Calceolaria alba
Celsia Arcturus
Chrysanthemums
Cinerarias
Convolvulus Cneorum
Diplacus glutinosus
Fragaria (Strawberry) indica
Hypericum chinense
Iberis gibraltarica
Kalosanthes coccinea
Lotus peliorynchus
Lychnis grandiflora

In House absolutely Unheated.

Francoa appendiculata
,, ramosa
Helleborus niger
Heuchera sanguinea and alba
Leontopodium alpinum (Edelweiss)
Linum monogynum
,, narbonense
Lobelia cardinalis vars.
Megasea crassifolia
Mimulus maculosus
,, moschatus
Myosotis dissitiflora (Forget-me-not)
,, palustris
Ononis rotundiflora
Orobus vernus
Papaver nudicaule
,, umbrosum
Pinks of all kinds
Phlox amœna
,, divaricata
,, subulata vars.
Physalis Franchetti
Primula auricula
,, denticulata
,, japonica
,, Sieboldi
,, verticillata
Saxifraga Cotyledon
,, Fortunei
,, sarmentosa, and many others
Stocks Intermediate
Spiræa japonica
Tiarella cordifolia (Foam-flower)
Tricyrtis hirta
Trollius asiaticus
,, europæus
Vinca angustifolia
,, elegantissima, and others

In House with Winter Temperature not below 35°.

Mesembryanthemum aurea
,, blanda
,, rosea
,, glaucum, &c.
Pentstemon Cobæa
,, Murrayanus
,, speciosus
Rochea falcata
Salvia Bethelli
,, Pitcheri
,, rutilans
Sedum carneum variegatum
,, Sieboldi
Swainsonia galegifolia alba

Roses, China Pink, Cramoisie-superieure, Mme. Eugène Résal, Mme. Laurette Messimy, Fabier, Polyantha Roses, Perle d'Or, Gloire des Polyanthes do well in pots for early spring.

SHRUBS*

Selection of Deciduous Flowering Shrubs for Small Gardens

Cytisus præcox
Daphne Mezereum
Diervillas (Weigelas)
Exochorda grandiflora (Pearl Bush)
Forsythia suspensa
Hibiscus syriacus of sorts, especially totus albus
Hydrangea paniculata-hortensis
Hypericum moserianum
Lonicera Standishii
Magnolia stellata
Philadelphus grandiflorus (Mock Orange)
Prunus triloba
,, (Cydonia) japonica
Pyrus (Cydonia) japonica cardinalis
Rose Acacia
Spiræa arguta
,, nobleana
,, Japonica Anthony Waterer
Syringas (Lilacs)
Viburnum opulus sterilis (Guelder Rose)

* These selections are only intended for quite small gardens, therefore many good kinds must necessarily be omitted.

Deciduous Flowering Trees for Small Gardens

Almond, The
Amelanchier canadensis (Snowy Mespilus)
Cotoneaster frigida
Double rose and Double scarlet Cratægus (Thorns)
Laburnum
Magnolia conspicua
Prunus Avium flore pleno (Double Wild Cherry)
,, Cerasus
Pseudo-cerasus Watereri
Pyrus (Malus) floribunda
,, floribunda flore pleno
,, spectabilis
,, coronaria fl. pl.

Evergreen Flowering Shrubs for Small Gardens

Azaleas, hardy
Berberis Darwinii
,, stenophylla
Ceanothus azureus (Gloire de Versailles)
Escallonia macrantha (tender)
,, Philippiana
Kalmia latifolia
Ligustrum sinense
Olearia Haastii
Rhododendron of sorts
Viburnum Tinus (Laurustinus)
Yucca recurvifolia

Trees and Shrubs with Beautiful Fruit

Arbutus
Berberis
Cotoneasters
Cratægus (Thorns) of sorts
Euonymus (Spindle Tree) europæus
,, latifolius
Hippophæ rhamnoides (Sea Buckthorn)
Hollies of sorts
Pernettyas of sorts
Sambucus racemosus
Skimmias
Symphoricarpus racemosus (Snowberry)
Viburnum Opulus (Wild Guelder Rose)

Evergreen Trees and Shrubs Suitable for Planting near the Sea Coast

Arbutus Unedo
Austrian Pine (a splendid shelter)
Buxus (Box) sempervirens
Choisya ternata
Cotoneaster microphylla
Cupressus macrocarpa
Escallonias
Euonymus
Garrya elliptica
Osmanthus ilicifolius
Pernettyas
Quercus Ilex
Tamarix gallica
Veronicas

Deciduous Shrubs Suitable for Planting near the Sea Coast

Buddleia globosa (Orange Ball tree)
Deutzias
Fuchsia Riccartoni
,, globosa
,, macrostemma, and others
Fuchsia Riccartoni makes a charming hedge; crimson with flowers from summer onwards
Hippophæ rhamnoides (Sea Buckthorn)
Hydrangeas
Leycesteria formosa
Symphoricarpus (Snowberry) racemosus
Tamarisk
Viburnum Opulus (Wild Guelder Rose)

Trees and Shrubs with Conspicuous Bark in Winter

Betula (Birch) alba
,, populifolia
Cornus alba (Dogwood)
Fraxinus (Ash) excelsior aurea
Rubus biflorus (with quite white stems)
Salix vitellina aurea (Golden Willow)

Weeping Trees and Shrubs

Betula (Birch) alba pendula
,, alba Youngii
Fagus (Beech) sylvatica purpurea pendula
Fraxinus (Ash) excelsior pendula
Ilex (Holly) aquifolium argentea pendula
,, Aquifolium pendula
,, ,, ,, aurea
Picea (Pine) morinda
Populus (Poplar) grandidentata pendula
,, Parasol de St. Julien
Salix (Willow) babylonica
,, Caprea pendula
Taxus (Yew) baccata Dovastoni aurea pendula
Taxus baccata pendula
Ulmus (Elm) montana pendula

Shrubs Suitable for Planting under the Shade and Drip of Large Trees

Aucubas
Berberis Aquifolium
Box
Cornus
Cotoneaster microphylla
Daphne Laureola
,, pontica
Gaultheria Shallon
Hypericum calycinum (St. John's Wort)
Ivy
Phillyrea media
Ruscus (Butcher's Broom)
Symphoricarpus (Snowberry) racemosus
Vincas (Periwinkles)

Trees not to Plant near Towns

Abies
Araucaria imbricata (Monkey Puzzle or Chili Pine)
Picea
Pinus
Podocarpus
Sciadopitys verticillata
Thujopsis dolobrata, and Conifers generally

As a rule all Pines and Conifers are a complete failure in or near large towns.

Shrubs Suitable for Winter Bedding and Window Boxes

Aucubas
Box, gold and silver-leaved varieties
Cryptomeria elegans
Cupressus lawsoniana erecta viridis
,, ,, Silver Queen
,, ,, aurea
Ericas
Euonymuses
Laurustinus
Ligustrum (Privet) macrophyllum
Ligustrum ovalifolium aureum
Osmanthuses
Pernettyas
Pieris floribunda
Retinosporas
Skimmias
Taxus baccata elegantissima
Thuya (Biota) orientalis semperaurescens
Tree Ivies
Yucca recurvifolia

Trees and Shrubs for Forcing

Azaleas (Mollis and forms)
Choisya ternata
Clethra alnifolia
Deutzia gracilis
,, Lemoinei
Guelder Rose
Hydrangea paniculata
Kalmia latifolia
Kalmia angustifolia
Pieris floribunda
Prunus (Plum) of sorts
Spiræa media
,, Thunbergii
Staphylea colchica
Syringas (Lilacs)
Wistaria

Low-Growing Shrubs and Conifers for the Rock-Garden

Cryptomeria japonica nana
,, elegans nana
Cupressus lawsoniana nana
Dabœcia polifolia and its varieties
Daphne Cneorum
,, alpina
,, blagayana
Empetrum nigrum

Ericas of sorts
Gaultheria procumbens
Helianthemum of sorts
Juniperus prostrata
Leiophyllum buxifolium
Picea excelsa clanbrassiliana
,, pygmæa
Rhododendron ferrugineum
,, anthopogon
Thuya plicata minima

Hedge Plants

Beech
Berberis Darwinii
,, vulgaris
Box Tree
Buckthorn
Cupressus lawsoniana
,, nootkatensis
Euonymus japonicus
Fuchsias
Holly
Hornbeam
Juniperus chinensis
Privet
Quick or Thorn
Taxus baccata (Yew)
Thuya Menziesii
,, occidentalis

Plants for Pond Sides.

Arrowhead, Double White
Arum Lily (where mild enough)
Buckbean
Cardinal and Yellow Willows
Day Lilies
Ferns, especially the Royal Fern and Ostrich Fern (Struthiopteris)
Globe-flowers (Trollius)
Gunnera scabra
,, manicata
Herbaceous Phloxes
Iris Kæmpferi (Japan Iris)
Iris sibirica
,, Pseudacorus (English Iris)
Japan Primrose (Primula japonica)
Loosestrife (Lythrum Salicaria and roseum superbum)
Marsh Marigolds (Caltha palustris)
Polygonum sachalinense, 9 ft.
,, cuspidatum
Ranunculus Lingua (Great Spearwort)
Spiræa palmata
Willow Herb (Epilobium)

A Few Plants for Water Surface

Nymphæas (Water Lilies), many lovely hybrids, colours from white to intense crimson
Cape Pond-flower (Aponogeton distachyon)
Water Forget-me-not

CONIFERS

These shrubs and trees are not so popular as formerly, and we are in a measure thankful for this, as they were chosen recklessly, many very tender kinds being planted in gardens. It is a great mistake to put the Chili Pine (Araucaria excelsa), also known as the Monkey Puzzle, in a small garden, when we have so many beautiful flowering shrubs. One may write the same of the Deodar. Conifers are useless in towns. Abies and Piceas are much confused in nurseries, so we give the names according to the Kew standard. The finest Conifers are :—

Abies cephalonia (Grecian Silver Fir), will grow to a height of 60 feet ; light green leaves, silvery underneath, north aspect best.

A. amabilis, vigorous, handsome, deep glossy green, silvery white lines on under side of leaf.

A. concolor and variety violacea, both good hardy and effective trees.

A. nobilis, will grow 250 feet high in its native home of California ; give moist soil, open position.

A. nordmanniana (Nordmann's Fir), one of the most beautiful of Silver Firs.

Cedrus Deodara (Deodar Cedar).—Very elegant, Himalayas, good for lawn or to form an avenue ; well suited for planting near towns. Robusta, erecta, and variegata are very distinct.

C. Libani (Cedar of Lebanon) is well known, and another beautiful cedar is C. atlantica, which is quite hardy and is a success in hungry soils. Good varieties are fastigiata, erect in growth ; aurea, with golden foliage ; and glauca, silvery.

Cryptomeria japonica (Japan Cedar): sheltered position, rich soil, but must not be exposed to biting winds. Elegans is a graceful variety. In spring its narrow pointed leaves are pale green and in winter quite bronzy colour. Lobbi and Lobbinana are good forms.

Cupressus.—An important Conifer group for small gardens. The kinds named succeed in ordinary soil. Retinosporas are included amongst the Cupressus. *C. macrocarpa* (Monterey Cypress), excellent for sea coast; *lutea* is a good golden form. *C. nootkatensis* (*Thujopsis borealis*) is very handsome, perfectly hardy, and graceful, suitable for lawns. The finest varieties are *compacta*, *pendula*, *gracilis*, *aurea*, *variegata*, and *lutea*, the last named being very showy. *C. lawsoniana* (Lawson Cypress) is free, graceful, succeeds in almost any soil, and makes a good hedge, as it does not mind pruning. It is very pretty in spring when its male catkins appear in profusion. The most distinct varieties are: *Darleyensis*, bronzy yellow leaves, useful for small gardens, and effective in winter; *gracilis*, *albo-spica*, tipped with creamy white, and *lutea*, rich yellow foliage. *C. obtusa* (*Retinospora obtusa*) is an excellent Conifer for small gardens, and its varieties *compacta*, *filifera*, with long pendulous thread-like shoots; *aurea*, rich yellow foliage, touched with bronze brown in winter; and the golden-leaved *gracilis aurea*. *C. pisifera* (*Retinospora pisifera*) is of elegant growth; moist soil—*aurea* is a golden-leaved form. *C. plumosa* is a charming lawn Conifer, and the variety *aurea*, one of the best variegated shrubs in gardens. A well-drained soil and position are needful.

Salisburia adiantifolia or *Ginkgo biloba* is a very distinct and quite hardy Conifer, especially adapted for town gardens. Its autumn tints are rich yellow and orange.

Juniperus (Junipers). The following are quite hardy and happy in well-drained soil: Red Cedar (*J. virginiana*), excellent for fringe of lawn, rich green leaves, passing to brown in winter. *J. chinensis* is erect, with small, stiff glaucous leaves; the silver-leaved variety *albo variegata* and the golden form *aurea* are effective, especially the last-named in winter. The Savin is a beautiful shrub for dry banks, and the variety *procumbens* is especially ornamental in winter. Other good varieties of the common Savin are *humilis*, *tamariscifolia*, *prostrata*, and *variegata*.

Larch is valuable, but too well known to describe. May be propagated from seed sown thinly in raised beds; cover seed with fine soil.

Piceas.—Closely allied to Abies; useful for park and garden. *P. Englemanni* and the variety *glauca* are very hardy and free; good for lawns. *P. morinda* (*Abies Smithiana*) is a noble fir, very hardy, pendulous growth, and very suitable for lawns. *P. pungens* and its varieties, *pungens* and *pendula*, are very ornamental. *P. excelsa* and forms are good garden pines.

Pines.—These must be for large gardens; but one cannot leave them out of a book of this kind. *P. Strobus* (Weymouth Pine), is elegant, with straight, much-branched trunk, and long glaucous leaves. *P. Laricio* (Corsican Pine) is a fine seaside Pine, and makes a handsome shelter. *P. austriaca* (Austrian Pine) is one of the most popular Pines, very hardy and vigorous, and makes a good shelter on the coast. *P. Cembra* (Swiss Stone Pine) is a beautiful lawn tree. *P. Pinea* (Stone Pine) is a fine lawn tree, but rather tender; loamy soil. *P. excelsa* (Bhotan Pine), hardy, graceful, and likes dry soil.

Taxus (Yew).—The English Yew is *T. baccata*, and is beautiful on the lawn, and its adaptability for hedges and windbanks is well known. It enjoys best a rather moist soil, but will grow almost anywhere. Plant in spring or autumn. Get seedling plants.

Thujas.—An important group. *T. lobbi*, or *gigantea* as it is called, is an excellent Conifer. *T. japonica* is pretty in winter. *T. occidentalis* (American Arbor Vitæ) makes an excellent hedge. *T. orientalis* makes a bushy shrub. *T. ericoides*, or *Retinospora ericoides*, is a popular Conifer, with delicate green leaves, stained with violet-brown.

STOVE PLANTS *

NAME.	SEASON OF FLOWERING.	REMARKS.
Allamanda . . .	Summer	Handsome climbing plants, bearing numerous large, showy, yellow flowers. Propagate by means of cuttings in spring. Succeed best when planted out, or in a very large pot. Compost, fibrous loam, with some coarse sand and cow manure added. Prune the shoots annually in early spring to within two joints of the old wood. Do not shade except from very hot sun. A. Schotti, A. nobilis, Chelsoni, and A. grandiflora are the best.
Anthurium crystallinum .	...	Has large velvety green leaves; the veins beautifully marked with white; a handsome foliage plant. Requires a compost of peat, sphagnum moss, and charcoal; preferably grown in pans, well drained. Plants must be so placed as to be on a slight mound when the potting is finished. Propagate by dividing the plants very carefully in early spring. Afford plenty of moisture.
A. scherzerianum . .	Throughout many months	The chief beauty of this plant and its numerous varieties is centred in the brightly-coloured spathes. It grows about 1 foot high, and forms a charming object when the spathes are at their best. They remain bright for a long time.
Aralia	...	Several Aralias, notably A. Veitchi, A. Veitchi gracillima, and A. elegantissima, are very elegant foliage plants; most suitable for table decoration. Soil, loam and peat with silver sand. Usually propagated by grafting.
Aphelandra aurantiaca .	Winter	Evergreen, bearing very showy, orange-scarlet flowers. After the flowering season, diminish supply of water, giver lower temperature, and prune about March to two buds from the old wood. When shoots begin to appear, remove plants to the stove and repot in fibrous loam, peat, and silver sand.
Achimenes . . .	Summer	Beautiful stove flowering plants; herbaceous perennials, having underground tubercles. These should be placed several in a 6-inch pot from January to March so as to provide a succession of bloom. Grow in peat and leaf soil with a little silver sand and manure incorporated, placing

* As beginners seldom start with stove plants, a brief list of only the most important kinds is given.

NAME.	SEASON OF FLOWERING.	REMARKS.
Achimenes . . .	Summer	the tubercles about ½ inch below the soil. Tie the stems to neat stakes as they grow. After flowering, gradually decrease water supply, and finally withhold altogether during winter, placing the pots on their sides in a warm house.
Begonia	...	The varieties of Begonia Rex are well worth growing for their prettily marked, handsome leaves. Propagated by leaf cuttings obtained by inserting the leaves in a pan of sand, partially covering and making incisions across the principal ribs. Of easy culture in a soil composed of peat and loam with plenty of silver sand. Some of the best stove flowering Begonias are the following: B. Gloire de Lorraine, B. socotrana, B. nitida, B. manicata, B. metallica, B. hydrocotifolia, B. Winter Cheer, B. Ensign, B. Mrs. Heal, B. Gloire de Sceaux. B. socotrana forms a number of small bulbs at the base of its stems; it rests during summer, beginning to grow about September, flowering during winter. The others above mentioned may be propagated by division of the root or from seed, and, with the exception of B. metallica, are winter flowering. B. manicata is a very easily grown kind. It may be raised from cuttings in early April, and put singly into 2½-inch pots, or three in a 6-inch size. They will strike readily upon a hot-bed. When rooted place them in a frame, giving increased quantity of air, and in mid-June transfer them to pots 4½-inch and 6-inch in size. When three cuttings are put into one pot, these may be moved without separation from the 6-inch pot to an 8-inch one. During the summer keep the plants in a frame, and give air on all favourable occasions, moving the plants when colder days come to a house with a temperature of about 50 degrees. Water the plants when the pots are full of roots with weak liquid manure. Never injure the large fleshy leaves. The pretty pink-tinted flowers are produced in panicles, and a plant in full beauty is delightful.
Bouganvillea glabra .	Summer	Shrubby climber suitable for either stove or greenhouse, producing masses of rosy purple bracts. Does best when planted out. Prune to one or two buds in February. Give liberal treatment: loamy soil with silver sand mixed in.

NAME.	SEASON OF FLOWERING.	REMARKS.
B. spectabilis . . .	Early Summer	Bracts, warm brick red. Similar treatment as above.
B. sanderiana . . .	Summer	A handsome and valuable variety of B. glabra.
Caladium	...	Valuable ornamental leaved tuberous rooted perennials; remarkable for the varied beauty of their foliage. The tubers remain in their pots throughout the winter exactly as Achimenes; they are started in March, placing one in a 4½-inch or 6-inch pot according to size; use rough, rich peaty soil, and plenty of silver sand. Towards July diminish the water supply, and gradually dry off. Shade from hot sun only.
Clerodendron Balfouri .	Summer	Shrubby climber, bearing panicles of numerous showy scarlet flowers, with large, prominent white sepals. Prune after flowering, and keep somewhat dry during winter. Give a good loamy soil, and plant out if possible in preference to pot culture.
Codiæum (Croton) . .	...	Perhaps the most valuable decorative stove plants we have; remarkable for the fine markings of their leaves. Propagated best by rooting the tops; this is done by making an incision in the stem in spring, and covering this with moss. Roots will form in a few weeks, when the shoot may be removed and potted. Crotons like plenty of sun, moisture, and heat, and a fairly rich, sandy soil. Some of the best varieties are: Queen Victoria, golden yellow, mottled with green; undulatum, crisped margins to the leaves, claret colour, blotched crimson; Reedi, very fine, brick-red shade predominating; chelsoni, narrow, orange and crimson; Baron Frank Sellière, pretty green and white; Aigburth Gem; Van Oerstedii, charming, very dwarf, green and yellow; Flamingo, handsome, dark red; Mrs. Iceton, light yellow and carmine shades.
Dipladenia amabilis . .	Summer	A beautiful climber; flowers of a lovely rosy crimson.
D. brearleyana . . .	Summer	Climber; flowers pink, changing as they age to rich crimson. The Dipladenias mentioned are charming stove plants, although the flowers are not long lasting. Propagate by cuttings taken in the spring when the old plants begin to grow. Give them plenty of heat and moisture, and finally plenty of light to mature the wood well. Prune after flowering, and keep somewhat dry during winter.

NAME.	SEASON OF FLOWERING.	REMARKS.
Dracæna	...	Ornamental foliage plants, of value for house decoration. Propagate by "ringing," that is, mossing the tops, and removing them when rooted, as with Crotons. Similar culture to that advised for the latter. D. amabilis, D. Baptistii, D. sanderiana, D. goldieana, D. Lord Wolseley, D. ignea, D. The Sirdar, D. Eckhautei, &c.
Eranthemum nervosum (pulchellum)	Winter	A valuable winter-flowering plant; flowers bright blue, and freely produced over a long period. Easily propagated from cuttings in spring; loamy soil.
Eucharis amazonica . .	...	Charming bulbous plant, bearing racemes of pure white pendulous flowers often two and three times in one year. Several bulbs (four or five) should be placed in a 10-inch pot, and, until the pot becomes full of roots, water sparingly. When well rooted they enjoy plenty of manure water, and must be well shaded to preserve the dark green of the leaves.
Fittonia	...	Dwarf, semi-creeping plants, with beautifully marked leaves; very useful for growing to furnish an edging in the stove. F. argyroneura (silver leaved) and F. Verschaffelta (red-veined leaves) are the two best.
Gardenia radicans . .	Early Spring and Summer	A shrub bearing deliciously-scented pure white flowers. Propagate by cuttings taken with a heel of the old wood attached, in January. Succeed best when planted in a well-drained bed of loam containing plenty of coarse sand. A lower temperature is essential when growth is finished. Young plants flower more freely than old ones.
Gloriosa superba . .	Summer	A bulbous climber, producing curious showy flowers of a rich orange and red, and prettily crisped. Little water is required until the annual growths are fairly vigorous. After the flowers fade, gradually withhold water, and keep the soil quite dry in winter.
Gloxinia	Early Summer	Indispensable bulbous flowering plants. The bulbs are placed singly in well-drained 4½ or 6-inch pots, according to their size, in a rich, leafy soil, in January and February. Plenty of water is necessary when the plants are well rooted. Gradually dry off when the flowers are over, and winter in a warm house, turning the pots on their sides. Handle very carefully, as the leaves break easily.
Pancratium fragrans .	Summer	A bulbous plant, producing sweetly-scented, beautiful white flowers, which, however, do not last long. Of easy

NAME.	SEASON OF FLOWERING.	REMARKS.
Pancratium fragrans .	Summer	culture in good loam made porous by the addition of sliver sand. Do not repot more than is absolutely necessary; rather give stimulants in the way of farmyard or artificial manures.
Pandanus Veitchi . .	...	This is a useful, ornamental-leaved plant, and very suitable for house decoration. Propagated by offsets, produced naturally. Use soil composed of half peat and half loam.
Poinsettia pulcherrima .	Early Winter	Valuable for its brilliant scarlet bracts during winter; these remain in full beauty for many weeks. Propagated by cuttings inserted in early spring; place in small pots plunged in a mild hot-bed. Water very carefully throughout, or the bottom leaves will be lost. After the bracts are over, gradually withhold water, keeping quite dry in winter. Plenty of cuttings may be had when the old plants break into growth in the spring.
Phyrnium variegatum .	...	This plant has beautifully variegated leaves, pale green and creamy white. Likes a soil not too rich, and must be carefully watered. Give a light position. Propagated by offshoots.
Nepenthes . . .	...	This is the Pitcher plant, of which there are many species and varieties. They are more quaintly curious than beautiful. Give them a position near the glass. Basket culture is necessary, and a compost of sphagnum moss and peat and plenty of drainage. N. dicksoniana, N. mastersiana, N. mixta, N. Curtisii superba, N. Morganiæ, are some of the best.
Solanum Wendlandi .	Summer	A shrubby climber, producing bunches of lovely lilac-blue flowers in great profusion. Prune after flowering, and keep rather dry in winter,
Stephanotis floribunda .	Early Summer	A climber that should be in every collection of stove plants, producing numerous clusters of beautiful, waxy-white, sweetly-scented flowers. Propagate by cuttings of previous year's wood, inserted in spring. It succeeds best planted out in a well-drained bed of loam.
Torenia Fournieri and T. asiatica	Summer	Charming summer-flowering plants. T. Fournieri has hooded flowers, pale violet and yellow; T. asiatica similar shaped blooms of blue and violet. There is also a light-coloured variety of T. Fournieri. They are easily raised from seed sown in spring. The seedlings should be pricked out into 6-inch pots, placing them about an inch apart. Give them a light, sandy soil, consisting of loam and leaf mould.

Walls, Plants for.—Wall-gardening, among its many charms and merits, has the great one of making a good show sooner than can be obtained in any other kind of permanent planting. When we plant shrubs and trees we have to wait four or five years before they look at all mature; a border of hardy plants must have at least two years to come to fair strength; but wall plants, with their roots in the cool depths and their heads in the sun, grow away at once, and reward the careful planter well within the year.

Now the means whereby these delightful results may be obtained is within the reach of all. It is only needful to secure that the wall shall be thick enough to allow the moisture to condense within it. The retaining walls are the best, because the soil that is supported by one of their sides stores a constant supply of moisture in immediate contact with them. In such a wall you have only to make a little opening, unless you find one ready, and to introduce the roots of your plant, and to fix it in position with a little moss or sphagnum, or a little rather stiff mould; then you make it all firm by means of a few small angular stones that you can even secure with cement if it should seem desirable. Often it does quite well to sow the seeds of such plants as are easily raised in this way, such as Erinus, *Linaria alpina*, &c.; these you introduce into the fissures by means of some rather stiff soil with which the seeds have been incorporated. In a very few years you will have a wall so superbly beflowered that it will draw enthusiastic expressions of admiration both from yourself and from your friends.

In Miss Jekyll's charming book, "Home and Garden," p. 116, there are notes about wall-gardening which are both interesting and instructive: "One of the best and simplest ways of growing rock plants is in a loose wall. . . . An exposure to north or east and the cool backing of a mass of earth is just what most Alpines delight in. A dry wall, which means a wall without mortar, may be anything between a wall and a very steep rock-work, and may be built of brick or of any kind of local stone. . . . A dry wall needs very little foundation; two thin courses underground are quite enough. The point of most structural importance is to keep the earth solidly trodden and rammed behind the stones of each course and throughout its bulk, and every two or three courses to lay some stones that are extra long front and back, to tie the wall well into the bank. A local sandstone is the walling material."

Many, indeed almost all the plants recommended in our list of rock-garden plants may be grown in the wall, such as the pretty Erinus, Rock Pinks, especially the Cheddar Pink, and the Wild Carnation (*Dianthus Caryophyllus*), Aubrietias, Alyssums, Arabis, Iberis, Alpine Harebells, not forgetting the Wall Ferns, Wall Rue, Hard Fern, Common Polypody, and others, also Houseleeks, Saxifrages, Sedums (Stonecrops), Thymes, and the pretty Sandworts (Arenaria). Sowing the seed as the wall is being made is best, and Ferns should be planted in this way also. A host of plants will flourish in a wall that are not usually regarded as suitable for this purpose, Verbascums as an example, which will send up spikes several feet high in this position. Never overplant a wall. A few Snapdragons, Wallflowers, or whatever may be planted, are better than attempting too much, especially upon very old walls. In the spring when seedlings are coming up it is wise to gently syringe the wall in the evening or very early morning, especially if much exposed to the sun.

Room and Window Plants.—In the chapters upon bulbous and other plants for the greenhouse, and in the notes in the chapter about "Useful Hints," sufficient, we think, has been said upon room and window plants to satisfy the beginner. Beyond the foliage plants mentioned little can be grown without a greenhouse. The window gardener should place great faith in bulbs, which are invariably a success. Hyacinths in glasses or in pots, Blue Scillas, Daffodils, Crocuses, Chionodoxes, Snowdrops, Tulips, and other spring flowers, *Vallota purpurea*, and frequently Cacti, such as the Phyllocacti, are a success. Of Ferns select *Pteris cretica*, its variety *albo-lineata*, *Onychium japonicum*, *Cyrtomium falcatum*, and *Asplenium bulbiferum*. And as basket plants *Campanula isophylla*, the white variety *alba*, *i. Mayi*, *C. muralis*, *C. turbinata*, Creeping Jenny, and the Common and Harrison's Musks. Hyacinths, Tulips, and almost all of the familiar spring-flowering bulbs may be grown in pots, simply placed at first in a cool, frost-proof cellar, and then when growth begins brought to the light. When growing Hyacinths in glasses never let the water quite touch the bulb. First place the glasses in a dark cupboard to promote root growth, then inure to the light. The Sacred Lily may be grown in a bowl filled about half-full of small stones, the bulb firmly placed in the centre, and the stones heaped around it until about three-quarters of it is covered. Then fill up with water. The room in which the Sacred Lily (which is really a variety of *Narcissus Tazetta*) is grown must not be too warm. Examine the bowl frequently, as the bulb absorbs much water. A pinch of artificial manure when full growth is being made is helpful. The bulbs are valueless after they have flowered, but Hyacinths grown in glasses may after they have ripened be planted out of doors. Never use any bulb twice for flowering in glasses. Nurserymen keep special varieties of bulbs for this purpose.

Strawberries in Barrels.—This is quite a new and novel way of growing the Strawberry, and those who wish to try experiments should purchase barrels especially made for this purpose by Messrs. John Jackson & Co., 17 Philpot Lane, London, who, we feel sure, would give those who intend to grow Strawberries in this way all the help possible to secure good results.

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E. T. C.

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